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March 17, 2010

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555-0001

Subject: Duke Energy Carolinas, LLC
Oconee Nuclear Station, Units 1, 2, and 3
Docket Numbers 50-269, 50-270, and 50-287
Application for Technical Specification Change Regarding Risk -Informed Justification for the Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program
License Amendment Request (LAR) No. 2009-10

In accordance with 10 CFR 50.90, Duke Energy Carolinas, LLC (Duke) proposes to amend Appendix A, Technical Specifications, for Renewed Facility Operating Licenses Nos. DPR-38, DPR-47, and DPR-55 for Oconee Nuclear Station (ONS), Units 1, 2, and 3. This LAR adopts Technical Specification Task Force (TSTF)-425, Rev. 3, and would modify ONS technical specifications by relocating specific surveillance frequencies to a licensee-controlled program with the implementation of Nuclear Energy Institute (NEI) 04–10, "Risk-Informed Technical Specification Initiative 5B, Risk-Informed Method for Control of Surveillance Frequencies."

Attachment 1 provides a description of the proposed change, the requested confirmation of applicability, and plant-specific verifications. Attachment 2 provides documentation of Probabilistic Risk Assessment (PRA) technical adequacy. Attachment 3 provides the existing Technical Specification (TS) and Bases pages marked up to show the proposed change. Attachment 4 provides retyped TS and Bases pages. Attachment 5 provides a Proposed No Significant Hazards Consideration. Attachment 6 provides a cross reference table that correlates the TSTF surveillance numbers to the Oconee surveillance numbers.

In accordance with Duke administrative procedures and the Quality Assurance Program Topical Report, these proposed changes have been reviewed and approved by the Plant Operations Review Committee. Additionally, a copy of this LAR is being sent to the State of South Carolina in accordance with 10 CFR 50.91 requirements.

Duke requests that this proposed license amendment be reviewed and approved by November 30, 2011 with implementation subsequent to 24 month fuel cycle LAR implementation, which is scheduled to be submitted by April 30, 2010. That LAR changes 18 month surveillance frequencies to 24 months to support a 24 month fuel cycle for Oconee. Duke plans to implement the 24 month fuel cycle change on Unit 2 during the fall 2011 refueling outage. Duke will also update applicable sections of the Oconee UFSAR, as necessary, and submit these

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changes per 10 CFR 50.71(e). There are no new commitments being made as a result of this proposed change.

Inquiries on this proposed amendment request should be directed to Boyd Shingleton of the Oconee Regulatory Compliance Group at (864) 873-4716.

I declare under penalty of perjury that the foregoing is true and correct. Executed on March 17, 2010.

Sincerely,

Dave Baxter, Vice President
Oconee Nuclear Site

Attachments:

1. Description of Proposed Change
2. Documentation of PRA Technical Adequacy
3. Technical Specifications and Bases – Mark Ups
4. Technical Specifications and Bases - Retyped Pages
5. Proposed No Significant Hazards Consideration
6. Surveillance Frequency Cross Reference Table

cc w/ attachments:

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Oconee Nuclear Station

Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program (TSTF 425)

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ATTACHMENT 1

DESCRIPTION OF PROPOSED CHANGE

(Description and Assessment)

1.0 Description

The proposed amendment would modify technical specifications by relocating specific surveillance frequencies to a licensee-controlled program with the adoption of Technical Specification Task Force (TSTF)–425, Revision 3, "Relocate Surveillance Frequencies to Licensee Control-Risk Informed Technical Specification Task Force (RITSTF) Initiative 5." Additionally, the change would add a new program, the Surveillance Frequency Control Program (SFCP), to Technical Specification (TS) Section 5.0, Administrative Controls.

The changes are consistent with NRC approved Industry/TSTF STS change TSTF-425, Revision 3, (Rev. 3) (ADAMS Accession No. ML080280275). The *Federal Register* notice published on July 6, 2009, announced the availability of this TS improvement.

2.0 Assessment

2.1 Applicability of Published Safety Evaluation

Duke has reviewed the model safety evaluation dated July 6, 2009. This review included a review of the NRC staff's evaluation, TSTF-425, Revision 3, and the requirements specified in NEI 04-10, Rev. 1 (ADAMS Accession No. ML071360456).

Attachment 2 includes Duke documentation with regard to PRA technical adequacy consistent with the requirements of Regulatory Guide 1.200, Revision 1 (ADAMS Accession No. ML070240001), Section 4.2, and describes any PRA models without NRC-endorsed standards, including documentation of the quality characteristics of those models in accordance with Regulatory Guide 1. 200.

Duke has concluded that the justifications presented in the TSTF proposal and the safety evaluation prepared by the NRC staff are applicable to Oconee Units 1, 2, and 3, and justify this amendment to incorporate the changes to the Oconee TS.

2.2 Optional Changes and Variations

The proposed amendment is consistent with the STS changes described in TSTF-425, Rev. 3, and the NRC staff's model safety evaluation dated July 6, 2009. Duke is proposing minor variations or deviations to the TSTF for the following reasons: 1) plant-specific Surveillances with Surveillance numbers that differ from the STS changes described in TSTF-425, Rev. 3, 2) TSTF-425 SRs that are not included in the Oconee TSs, 3) Oconee TS SRs that are of fixed frequency but are not in the TSTF-425 markup, or 4) frequencies in the Administrative Controls section of TS not addressed by TSTF-425. Duke's TSs were converted to STS using Revision 0. As a result there are differences between the Oconee TSs and the BWOG Rev. 3 STS. For example, TSTF 360, Revision 1, revised BWOG STS 3.8.4, 3.8.5, and 3.8.6 Action Tables and relocated preventative maintenance SRs to licensee controlled programs. Duke has not adopted TSTF 360; therefore, Oconee TS SRs for these TSs do not directly correlate with BWOG STSs. Duke also has many plant specific TSs that are not common to the BWOG STS.

Regardless of these differences, Duke proposes to relocate all surveillance frequencies except those that reference other approved programs, those that are purely event-driven, those that are event-driven but have a time component for performing the surveillance on a one time basis once the event occurs, or those that are related to specific conditions. Duke considers the differences to be minor variations or deviations of the type permitted by TSTF-425.

Attachment 6 provides a cross reference between the NUREG-1430 Surveillance Requirements (SRs) included in TSTF-425 versus the Oconee TS SRs included in this amendment request. This cross reference table correlates the following:

a. TSTF-425 SR with the corresponding Oconee SR,
b. TSTF-425 SRs that are not contained in the Oconee TSs and therefore not applicable, and
c. Oconee plant specific SRs that are not contained in TSTF-425 SR mark-ups but are applicable to this amendment request.

Concerning the above, Oconee SRs that correlate to TSTF-425 SRs (a) are not considered deviations from TSF-425, regardless of whether the SR numbers are different. TSTF-425 Surveillances that are not contained in the Oconee Technical Specifications (b) are not applicable to this amendment request. For Oconee plant specific SRs that are not contained in the TSTF-425 SR mark-ups (c), Duke has determined that the relocation of these Surveillance frequencies is consistent with TSTF-425, Revision 3, and the NRC Staff's model safety evaluation dated July 6, 2009 since they are purely fixed periodic frequencies and do not meet any of the four exceptions in Section 1.0, "Introduction," of the model safety evaluation, therefore, their relocation to a SFCP is consistent with TSTF-425.

The proposed amendment is also relocating several periodic SR frequencies that are located in the Administrative Controls Section of the TS (Section 5) as follows:

- Section 5.5.18, KHU Commercial Power Generation Testing Program, has two SRs that are performed on an 18-month frequencies
- Section 5.5.19, Lee Combustion Turbine Testing Program, has two SRs that are performed on a 12-month frequency and one SR that is performed on an 18-month frequency.
- Section 5.5.20, Battery Discharge Testing Program, has one SR that is performed on a 60-month frequency

Since these Section 5 SRs are of a fixed frequency and of the type permitted by TSTF-425 to be relocated, Duke considers their relocation as consistent with the TSTF.

3.0 Regulatory Analysis

3.1 No Significant Hazards Consideration

Duke has reviewed the proposed no significant hazards consideration determination (NSHC) published in the *Federal Register* July 2, 2009 (74 FR 31916). Duke has concluded that the proposed NSHC presented in the Federal Register notice is applicable to Oconee Units 1, 2, and 3 and is provided as Attachment 5 to this amendment request which satisfies the requirements of 10 CFR 50.91(a).

4.0 Environmental Consideration

Duke has evaluated the proposed amendment and has determined that the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

Oconee Nuclear Station

Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program (TSTF 425)

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ATTACHMENT 2

Documentation of PRA Technical Adequacy

Documentation of PRA Technical Adequacy

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2.1 Overview

The technical adequacy of the probabilistic risk assessment (PRA) must be compatible with the safety implications of the proposed Technical Specification (TS) changes and the role the PRA plays in justifying the changes. The Nuclear Regulatory Commission (NRC) has developed regulatory guidance to address PRA technical adequacy, Regulatory Guide (RG) 1.200 (Ref. 1), which references the American Society of Mechanical Engineers (ASME) PRA standard RA-Sb-2005, Addenda to ASME RA-S-2002 (Ref. 2) for internal events at power. External events and shutdown risk impacts may be considered quantitatively or qualitatively. RG 1.200 also references the NEI peer review process NEI 00-02 (Ref. 3).

The industry guidance document for the implementation of Initiative 5b is NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies". The NRC issued a Final Safety Evaluation for NEI 04-10 Revision 0, on September 28, 2006 (Ref. 4). The Staff found that NEI 04-10, Revision 0, was acceptable for referencing by licensees proposing to amend their TSs to establish a Surveillance Frequency Control Program (SFCP), provided that the following conditions are satisfied:

1. The licensee submits documentation with regard to PRA technical adequacy consistent with the requirements of RG 1.200, Section 4.2.

2. When a licensee proposes to use PRA models for which NRC-endorsed standards do not exist, the licensee submits documentation, which identifies the quality characteristics of those models, consistent with RG 1.200, Sections 1.2 and 1.3. Otherwise, the licensee identifies and justifies the methods to be applied for assessing the risk contribution for those sources of risk not addressed by PRA models.

Subsequently NEI 04-10 Revision 1 was approved (Ref. 5) and is the current document of record.

The implementation of the SFCP at the Oconee Nuclear Station will follow the guidance provided in NEI 04-10, Revision 1 in evaluating proposed surveillance frequency changes.

The Oconee PRA is a full scope PRA including both internal and external events (i.e., flood, seismic, fire, high winds (tornado)). Having previously completed a self-assessment against the supporting requirements of ASME PRA Standard through addenda RA-Sc-2007 (Ref. 6), Duke Energy is planning to perform a self-assessment against the supporting requirements of ASME/ANS PRA standard RA-Sa-2009, Addendum A to RA-S-2008 (Ref. 7) for the current Oconee PRA model of record (including fire, seismic, and tornado models) in 2010. Also there is currently significant work being performed at Duke Energy in the area of fire PRAs. This will be discussed further in the Fire PRA Model section.

The following information is submitted by Duke Energy to address the conditions of the NRC Safety Evaluation for Initiative 5b.

2.2 Historical Summary

The original Oconee PRA was initiated in 1980 when Duke and Oconee Nuclear Station were selected to undertake an industry PRA project, managed by the Nuclear Safety Analysis Center (NSAC) of the Electric Power Research Institute (EPRI). The NSAC study was published in June 1984 as NSAC-60 (Ref. 8). This analysis was one of the first plant-specific PRA projects undertaken in the industry.

A very detailed review of NSAC-60 was performed which included meetings and site visits by the NRC and Brookhaven National Laboratory with Duke. The results of this review were completed and published in two volumes (internal events and external events) as NUREG/CR-4374 in March 1986. Regarding the internal events part of NSAC-60 the report concluded that the Oconee PRA study

> *"..is an excellent piece of work. The same tools were used as for the Reactor Safety Study (event trees/fault trees), but the Oconee PRA also added to the state of the art." "The Oconee PRA study successfully identified the major failure combinations that can lead to core damage."* (Ref. 9)

Regarding the external events part of NSAC-60 the report stated:

> *"Overall, the assessment of core damage frequency due to "external" events presented in the OPRA appears to use state-of-the-art methodologies, and within the stated scope the OPRA is a good piece of work."* (Ref. 10)

In January 1987, Duke Power Company initiated a complete review and update of the original study. On November 23, 1988, the NRC issued Generic Letter (GL) 88-20 (Ref. 11), which requested that licensees conduct an Individual Plant Examination (IPE) in order to identify potential severe accident vulnerabilities at their plants. The Oconee response to GL 88-20 was provided by letter dated November 30, 1990 (Ref. 12). In this letter Duke noted that the attached Revision 1 of the PRA consisted of a complete Level 3 PRA with a detailed analysis of both internal and external events. By letter dated April 1, 1993 (Ref. 13), the NRC provided a Staff Evaluation of the internal events portion of the above Oconee IPE submittal.

In response to Generic Letter 88-20, Supplement 4 (Ref. 14), Duke completed an Individual Plant Examination of External Events (IPEEE) for severe accidents. This IPEEE was submitted to the NRC by letter dated December 28, 1995 (Ref. 15). The IPEEE report contained a detailed write-up of the Oconee seismic and fire PRA analysis methods, results and conclusions. It also addressed other events such as high winds, floods, and transportation accidents. Several plant enhancements, as discussed in the submittal, were made as a result of the study.

Additionally, Duke submitted an IPEEE seismic relay chatter analysis report to the NRC on December 18, 1997 (Ref. 16) and subsequently responded to an NRC Request for

Additional Information (RAI) on the IPEEE submittal with letters to the NRC on March 31, 1999 (Ref. 17) and October 4, 1999 (Ref. 18).

By letter dated March 15, 2000 (Ref. 19) the NRC provided an evaluation of the IPEEE submittal. In the cover letter the NRC letter states:

> *"On the basis of our review of your submittals only, the staff has concluded that your IPEEE process is capable of identifying the most likely severe accidents and severe accident vulnerabilities at the Oconee Nuclear Station, Units 1, 2, and 3 and, therefore, that the Oconee IPEEE has met the intent of Supplement 4 to Generic Letter 88-20."*

While the IPEEE Program was a one-time review of external hazard risk and was limited in its purpose to the identification of potential plant vulnerabilities and the understanding of associated severe accident risks, there have not been significant numbers of plant changes made since the initial NRC review that would invalidate the methodologies (discussed later) used in the existing external events models of record.

In 1995, Oconee initiated Revision 2 of the 1990 IPE and provided the results to the NRC in 1997 (Ref. 20). Revision 3a of the Oconee PRA was completed in March 2005. This update was a major comprehensive revision to the PRA models and associated documentation. Revision 3a is the current model of record. Work is currently underway on Revision 4 of the Oconee PRA which is a major revision to the PRA and includes a planned revision to the fire PRA model (discussed in Section 2.4.3.1).

2.3 PRA Technical Adequacy Consistent With RG 1.200, Section 4.2

This section addresses Condition 1 of the NRC Safety Evaluation for Initiative 5b.

2.3.1 PRA Model Adequately Represents the as-built, as-operated Plant

The basis to conclude that the PRA model to be used adequately represents the as-built, as-operated plant is as follows.

The existing PRA Configuration Control Program at Oconee was assessed against Section 5 of the ASME PRA Standard to meet the requirements necessary to support risk-informed decisions. The results of the self-assessment concluded that the PRA fully meets the requirements for configuration control of a PRA to be used with the ASME PRA Standard to support risk-informed decisions for nuclear power plants. A summary of the program and the basis to conclude that the PRA model adequately represents the as-built, as-operated plant is provided below.

The PRA Configuration Control Program at Oconee is governed by the following workplace procedures.

- XSAA-101, Risk-Impact Review of Nuclear Plant Changes Including Nuclear Station Modification, and Emergency or Abnormal Procedure Changes

- XSAA-106 , PRA Maintenance, Update and Application

XSAA-101 addresses the process for review of plant design changes, plant emergency and abnormal procedure changes, and Technical Specification (TS) changes that have been made for PRA impacts. It also describes in detail the process used to review the impact of potentially significant changes that could impact the PRA before the changes have been made.

XSAA-106 addresses the conditions when a PRA update may be required (e.g., cumulative risk impact of unincorporated PRA changes exceeds a threshold such that the as-built as-operated plant is not adequately represented by the PRA). It addresses a process to assess the risk of a change to the plant and a method to prioritize the implementation of a plant change based on the risk impact to the PRA. It describes a process to ensure that an annual assessment is made of the cumulative impact of PRA changes that have not yet been incorporated into the PRA and provides guidance as to when a PRA update is needed based on the results of the annual assessment. Finally, it describes the electronic tracking tool that is used to track changes that impact the PRA until they are incorporated into the PRA.

The process is as follows. Notification of any completed (and planned changes that could significantly impact the PRA model) plant modifications, Technical Specification changes, or Emergency Procedure changes are sent to the PRA Section for a review of any PRA impacts. This review is documented. If a plant change is determined to impact the PRA then it is entered into the electronic tracking tool where a risk assessment is performed on the change. The outcome of the risk assessment will "bucket" the plant change into a Low, Medium, or High risk change category based on the estimated delta Core Damage Frequency (CDF) or delta Large Early Release Frequency (LERF) results. Plant changes that are determined to be of a Low risk impact are tracked to completion in the electronic tracking tool and are annually assessed for their cumulative impact on the PRA model. Plant changes that are determined to be of Medium or High risk impact are entered into the site corrective action program for further analysis as to their impact on current applications. They also are tracked to completion in the electronic tracking tool and are annually assessed for their cumulative impact on the baseline PRA model.

For any application that requires a PRA analysis (e.g., License Amendment Request (LAR) or Notice of Enforcement Discretion (NOED)) workplace procedures require that all of the outstanding PRA model changes listed in the electronic tracking tool are individually reviewed for their impact on the application. A justification is made as to why each item does not impact the PRA results used to support the application. This review is documented. If it is determined that an unincorporated change might impact an application then steps are taken to either perform sensitivity studies to demonstrate that the contributors significant to the application were not impacted or the PRA model is revised to address the impact of the change on the application. This analysis will also be performed and documented for every application of Initiative 5b.

The outstanding items in the electronic tracking tool are ultimately incorporated into a major PRA revision which is performed periodically to ensure that the overall number of items being tracked remains manageable. This robust process, governed by written procedures, is sufficient to ensure the PRA model represents the as-built, as-operated plant.

2.3.2 Unincorporated Changes to the Plant

The justification of how unincorporated changes to the plant will be addressed is provided in the response in Section 2.3.1.

2.3.3 Departures from ASME Requirements

The justification for departures from the ASME Standard Capability Category II requirements, including any unresolved findings/observations is as follows.

In May 2001, the PRA at Duke Energy's Oconee Nuclear Station received a peer review by an industry team of knowledgeable PRA practitioners (Ref. 21). Since the performance of this peer review, the industry has utilized the American Society of Mechanical Engineers (ASME) process to develop a standard identifying the requirements associated with PRA. RG 1.200 endorses the ASME PRA Standard as an acceptable method for demonstrating the technical adequacy of a PRA – provided various clarifications are made as identified in the regulatory guide.

In 2006, Duke Energy contracted Maracor Software & Engineering, Inc. to conduct an independent review of the Oconee PRA against the requirements of the ASME PRA standard through addenda RA-Sb-2005 (Ref. 22). Subsequently in 2008, as noted earlier, Duke Energy conducted a self-assessment of the Oconee PRA (Ref. 6) against the ASME PRA Standard through addenda RA-Sc-2007.

The Oconee PRA self-assessment included the Risk Assessment Technical Requirements listed in Section 4 of the ASME PRA Standard. This self-assessment evaluated the PRA with respect to Capability Category II. For the purposes of Initiative 5b, deviations from the Capability Category II supporting requirements were identified and dispositioned to ensure that these issues do not negatively impact Initiative 5b. For those requirements of the standard that have not been met, a justification of why it is acceptable that the requirement has not been met has been provided. A summary of these items is shown in Table 2-1 for Oconee (Ref. 6). Of the 26 items, 23 are either documentation or have no expected impact on Initiative 5b applications. The remaining three could have an impact based on the specific Initiative 5b application. A summary of these items is shown in Table 2-1 for Oconee.

Because of the broad scope of potential Initiative 5b applications, and the fact that the impact of assumptions may differ for each surveillance requirement being evaluated, Duke Energy will address each of the deviations from Capability Category II listed in Table 2-1 for the Oconee PRA respectively for each application of Initiative 5b on an application specific basis. Again, if a requirement is not met, a justification of why it is acceptable that the requirement has not been met will be provided. These results will be with the documentation package for the specific Initiative 5b application.

2.3.4 Methodology to be Used for Initiative 5b

NEI 04-10 provides the detailed process requirements for controlling surveillance frequencies of the TS Surveillance Requirements (SRs) that have been relocated from the TSs to the SFCP. The methodology described in NEI 04-10 provides a risk-informed process to support a plant expert panel (called an Integrated Decisionmaking Panel or IDP) assessment of proposed changes to surveillance frequencies, assuring appropriate consideration of risk insights and other deterministic factors, which may impact surveillance frequencies, along with appropriate performance monitoring of changes and documentation requirements.

The Duke Energy SFCP, including the methodology of assessing surveillance frequency changes utilized at Oconee, is consistent with NEI 04-10, Revision 1 and the supporting background document TSTF-425-A, Rev. 3 (Ref. 23).

2.3.5 Identification of Key Assumptions

Identification of Key Assumptions related to surveillance frequencies (if any) and how they will be addressed is given below.

The overall Initiative 5b process is a risk-informed process with the PRA model results providing one of the inputs to the IDP to determine if a surveillance frequency change is warranted. The methodology recognizes that a key area of uncertainty for this application is the standby failure rate utilized in the determination of the surveillance frequency change impact. Therefore, the methodology requires the performance of selected sensitivity studies on the standby failure rate of the component(s) of interest for the surveillance frequency change assessment.

Because of the broad scope of potential Initiative 5b applications, any key assumptions and approximations relevant to the results obtained for an application of Initiative 5b will be addressed and documented on an application specific basis. This includes not only the results of the standby failure rate sensitivity study, but the results of any additional sensitivity studies identified during the performance of the reviews as outlined in Sections 2.3.1, 2.3.2, and 2.3.3.

2.3.6 Resolution of Relevant Peer Review/Self-Assessment Findings and Observations

Section 2.3.3 discusses departures from the ASME PRA Standard Capability Category II requirements and summarizes them on Table 2-1 for Oconee. However as previously noted, because of the broad scope of potential Initiative 5b applications, and the fact that the impact of assumptions may differ for each surveillance requirement being evaluated, Duke Energy will address each of the deviations from Capability Category II listed in Table 2-1 for Oconee for each application of Initiative 5b on an application specific basis. If a requirement is not met a justification of why it is acceptable that the requirement has not been met will be provided. If the PRA model is changed for a specific application of Initiative 5b to address self-assessment findings or if a sensitivity study is performed to demonstrate contributors significant to the application were not impacted by a self-assessment finding, a discussion of the results and conclusions for resolution will be included in the documentation package. Duke Energy will maintain a current listing of deviations from ASME PRA Standard Capability Category II requirements for Oconee for review and resolution against each application of Initiative 5b.

2.3.7 Applicable Capability Category for Initiative 5b

In accordance with NEI 04-10, the PRA must meet Capability Category II to be used for Initiative 5b applications. Duke Energy will ensure the Oconee PRA used for Initiative 5b applications either fully meets Capability Category II or departures from Capability Category II are justified to show insignificant impact on the results of the analysis. This will be done by performing a review of all outstanding departures from Capability Category II against the specific Initiative 5b application being addressed. The results of this review will be in the documentation package for the specific Initiative 5b application.

2.4 External Events Considerations

This section addresses Condition 2 of the NRC Safety Evaluation for Initiative 5b.

Specifically it identifies quality characteristics for PRA models for which NRC-endorsed Standards do not exist, consistent with RG 1.200, Sections 1.2 and 1.3, and justifies the methods to be applied for assessing the risk contribution for those sources of risk not addressed by PRA models.

NRC endorsed standards currently exist for external hazards including seismic and fire PRAs. Revision 2 of Regulatory Guide (RG) 1.200 (Ref. 24), references the ASME/ANS PRA standard RA-Sa-2009, Addendum A to RA-S-2008 (Ref. 7) for internal and external hazards. An NRC endorsed standard does not currently exist for shutdown PRAs. NEI 04-10 references RG 1.200 Revision 1 and ASME PRA Standard RA-Sb-2005b as the governing documents for Initiative 5b.

The NEI 04-10 methodology allows for STI change evaluations to be performed in the absence of quantifiable PRA models for all external hazards. For those cases where the STI cannot be modeled in the plant PRA (or where a particular PRA model does not exist for a given hazard group), a qualitative or bounding analysis is performed to provide justification for the acceptability of the proposed test interval change. In general, it is not expected that seismic, fire, or other external hazards will play a significant role in the impact of a given surveillance frequency change.

This section discusses the Oconee overall external hazards analysis methodology, the Oconee specific seismic and fire PRAs, and describes the methodology to be used to address shutdown risk impacts for Initiative 5b consistent with the requirements of the NEI 04-10 methodology.

2.4.1 Overall External Hazards Analysis Methodology

The general approach used to develop the external event PRA at Oconee is as follows:

1) Identify all natural and man-made credible external events that may affect the site using many reference sources.

2) A screening analysis was conducted using defined bounding criteria in order to select those events that may require further review.

3) A scoping analysis was performed on the remaining non-screened events to determine those that warranted a detailed site and plant-specific analysis.

This approach is consistent with that previously submitted to the NRC in Section 2.3 of Reference 15 and Volume 1, Section 3.0 of Reference 12. These references provide a greater level of detail of the approach if needed.

2.4.2 Oconee Seismic PRA Model

The current Oconee seismic PRA model of record was last updated as part of Revision 3b of the PRA model (Ref. 25). However, the current methodology used is the same as that described in detail in the IPE submittal (Ref. 12) and Section 3 of the IPEEE submittal (Ref. 15), both of which have already been reviewed by the NRC. The reader is referred to those references for additional details of the seismic analysis.

The plant-specific seismic PRA analysis consists of four steps each of which are described below:

1) The Oconee site was evaluated to obtain the seismic hazard in terms of the frequency of occurrence of ground motions of various magnitudes. The site-specific hazard analysis (Ref. 26) was performed using the Seismicity Owners Group (SOG) methodology developed by EPRI for seismic hazard analysis of nuclear power plant sites in the Central and Eastern United States (CEUS). Uncertainties were addressed in the hazard analysis.

2) From the site-specific seismic hazard curve, the capacities of important plant structures and equipment to withstand seismic events were evaluated to determine conditional probabilities of failure as a function of ground acceleration for significant contributors (i.e., SSCs). These are commonly referred to as 'fragilities' or the site-specific fragility curves. Plant walkdowns were conducted, the most recent ones consistent with the guidelines of EPRI NP-6041 (Ref. 27).

3) An event tree was developed along with supporting top logic and system fault trees to reflect plant response to seismic events. These modified logic models were then solved to obtain Boolean expressions for the seismic event sequences of interest.

4) The Boolean expressions were quantified by convolving the probabilistic site seismicity and the fragilities for the plant structures and equipment obtained in steps 1 and 2. The resulting sequence frequencies are then integrated into the overall Oconee PRA risk results, resulting in final quantitative results.

The majority of changes to the current seismic analysis that have been made since the IPEEE submittal are the result of a Site Initiated Technical Audit (SITA) that was conducted in April 2003 (Ref. 28). SITA GO-03-05 performed an assessment of the

Oconee seismic PRA analysis and identified areas for improvement. A summary of these and other major changes not related to the audit is provided below.

1. Comprehensive review and revision of the seismic analysis documentation write-up.
2. Updated the component/structure fragility information for Jocassee Dam as a result of a new vendor analysis.
3. Made numerous model enhancements to the fault tree impacting many plant systems.
4. Updated the seismic analysis quantitative results table.

As noted previously, Duke Energy is planning to perform a self-assessment against the supporting requirements for seismic events of ASME/ANS PRA standard RA-Sa-2009, Addendum A to RA-S-2008 for the Oconee seismic PRA in 2010. The method as described in Section 2.3.3 of this attachment will be used to justify any departures from the ASME Standard Capability Category II requirements for each application of Initiative 5b. However, in accordance with the discussion in this section above, Duke considers the current seismic model of record as meeting the required quality characteristics of RG 1.200 Sections 1.2 and 1.3 and is therefore sufficient for use as is in the application of Initiative 5b surveillance frequency changes.

2.4.3 Oconee Fire PRA Model

The current Oconee fire PRA model analysis and methodology (Ref. 29) used in the model of record is the same analysis and methodology as described in the IPE submittal (Ref. 12) and Section 4 and Appendix B of the IPEEE submittal (Ref. 15), both of which have already been reviewed by the NRC. The reader is referred to those references for additional details of the fire analysis.

The plant-specific fire PRA analysis consists of four steps each of which are described below:

a. The Oconee site and plant areas were analyzed to determine critical fire areas and possible scenarios for the possibility of a fire causing one or more of a predetermined set of initiating events. Plant walkdowns were conducted and were documented. Screening criteria were defined for those fire areas excluded from the fire analysis.

b. If there was a potential for an initiating event to be caused by a fire in an area, then the area was analyzed for the possibility of a fire causing other events which would impact the ability to shutdown the plant. These were identified by reviewing the impact on the internal event analysis models. The initiating event frequencies of fires in the critical areas were estimated.

c. Each area was examined with an event tree fire model to quantify fire damage probabilities based on an evaluation of detection and suppression capabilities.

The event tree related fire initiation, detection suppression, and propagation probabilities to equipment damage states.

d. Fire sequences were derived and quantified based on the fire damage probabilities and the additional failures necessary for a sequence to lead to a core melt. The additional failures were quantified by the models used in the internal events analysis.

The major changes to the current fire analysis that have been made since the IPEEE submittal deal with revised base case fire initiating event frequencies, updated failure probabilities for some human reliability events, revised unavailability data, and updated reactor coolant pump seal LOCA split fractions.

Since the Oconee fire PRA model is integrated into the overall PRA model, quantitative fire risk insights will be obtained each time when the PRA model is exercised. When the integrated PRA model is not utilized for a quantitative assessment and modeling of the affected equipment is not feasible, the fire risk insights will be assessed qualitatively. This approach is consistent with the accepted NEI 04-10 methodology.

Duke Energy is planning to perform a self-assessment against the supporting requirements for fire events of ASME/ANS PRA standard RA-Sa-2009, Addendum A to RA-S-2008 for the Oconee fire PRA in 2010. The method as described in Section 2.3.3 of this attachment will be used to justify any departures from the ASME Standard Capability Category II requirements for each application of Initiative 5b. However, in accordance with the discussion in this section above, Duke considers the current fire model of record as meeting the required quality characteristics of RG 1.200 Sections 1.2 and 1.3 and is therefore sufficient for use as is in the application of Initiative 5b surveillance frequency changes.

2.4.3.1 Oconee Future State Fire PRA Model Initiative

In February 2005, Duke Energy notified the NRC (Ref. 30) of its intent to adopt National Fire Protection Association (NFPA) Standard 805, "NFPA 805, Performance-Based Standard for Fire Protection for Light-Water Reactor Electric Generation Plants," 2001 edition, pursuant to Section 50.48(c) of Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR 50.48(c)), at all of its nuclear stations.

In a letter dated June 8, 2005, the NRC accepted Duke's intent to adopt 10 CFR 50.48(c) (NFPA 805 Rule) for all three sites with Oconee Nuclear Station beginning the transition as a pilot plant on June 1, 2005 (Ref. 31). The Oconee Fire PRA model being developed uses guidance contained in NUREG/CR-6850/EPRI TR-1011989, EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities (Ref. 32).

Between March 17 - 21, 2008 NRC Staff and contractors conducted an on-site pre submittal audit of the Oconee Nuclear Station (ONS) Unit 3 fire probabilistic risk assessment (PRA) against the requirements of Part 3 (Internal Fires at Power Probabilistic Risk Assessment Requirements) of the American Society of Mechanical Engineers (ASME) and American Nuclear Society (ANS) combined PRA Standard, ASME/ANS RA-S-2008, "Standard for Level 1/Large Early Release Frequency

Probabilistic Risk Assessment for Nuclear Power Plant Application," (draft) (Ref. 33). The review was intended to determine whether the base fire PRA model is of sufficient technical adequacy and appropriate scope to support implementation of National Fire Protection Association (NFPA) standard NFPA 805. The NRC issued its final report in a letter to Duke dated August 7, 2008 (Ref. 34). Duke has already addressed many of the Fact/Observations from that review.

On May 30, 2008, Duke submitted a License Amendment Request (LAR) to the NRC to adopt the new fire protection licensing basis which complies with the requirements in 10 CFR 50.48(a), 10 CFR 50.48(c), and the guidance in Regulatory Guide (RG) 1.205 (Ref 35). The initial submittal was followed by several other submittals that supplied additional information to the NRC.

A review team, consisting of Nuclear Regulatory Commission (NRC) staff and contractors from Pacific Northwest National Laboratory and Brookhaven National Laboratory participated in a regulatory audit at Oconee Nuclear Station (ONS), Units 1, 2 and 3 from February 23 - 27, 2009. The regulatory audit supports the review of the Oconee submitted LAR. On April 6, 2009, the NRC provided a summary of the site audit in a letter to Duke (Ref. 36). Work continues on the implementation of this licensing basis change at Oconee.

2.4.4 Oconee Shutdown Risk Impact Analysis

Since no approved quantitative shutdown risk PRA model for shutdown events currently exists at Duke Energy, Oconee will either 1) utilize the plant shutdown safety assessment tool developed to support implementation of NUMARC 91-06 (Ref. 37) as described in Duke Energy Nuclear Station Directive (NSD) 403 (Ref. 38) or 2) perform an alternate qualitative risk evaluation process to assess the proposed surveillance frequency change that utilizes Initiative 5b. These are acceptable options to not having a quantitative shutdown PRA model in accordance with Section 4 Step 10 (and other places) of NEI 04-10. In either case, the guidance of NEI 04-10 will be followed.

2.5 Summary

In Section 2.3 of this document the Oconee PRA technical adequacy was evaluated in accordance with the requirements of RG 1.200, Section 4.2. Section 2.4 of this document submitted quality characteristics of the seismic and fire PRA models in accordance with the requirements of RG 1.200, Sections 1.2 and 1.3. A discussion of the qualitative method to address shutdown risk was also discussed in Section 2.4.

Because of the broad scope of potential Initiative 5b applications and the fact that the risk assessment details will differ from application to application, for each individual surveillance frequency interval request, a review of the unincorporated changes to the plant and remaining gaps to specific requirements in the PRA standard will be made to determine which, if any, would merit additional application-specific sensitivity studies in the final analysis.

The results of the discussions above provide a basis for concluding that the current Oconee Units 1, 2, and 3 PRA model is sufficiently robust and suitable for use in risk-informed processes such as that proposed for the implementation of a Surveillance Frequency Control Program.

2.6 References

1. Regulatory Guide 1.200, "*An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities*", Revision 1, US Nuclear Regulatory Commission, January 2007.
2. ASME RA-S-2002, "*Standard for Probabilistic Risk Assessment for Nuclear Power Plant Applications*", with Addenda ASME RA-Sa-2003 and ASME RA-Sb-2005, December 2005.
3. NEI 00-02, "*Probabilistic Risk Assessment Peer Review Process Guidance,*" Revision A3, Nuclear Energy Institute, March 20, 2000.
4. Letter, USNRC to Nuclear Energy Institute, "Final Safety Evaluation for Nuclear Energy Institute (NEI) Industry Guidance Document NEI 04-10, Revision 0, "Risk-Informed Technical Specifications Initiative 5B, Risk-Informed Method for Control of Surveillance Frequencies"", September 28, 2006.
5. NEI 04-10, Revision 1, "*Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies,*" April 2007.
6. DPC-1535.00-00-0013 (Cross references: CNC-1535.00-00-0094, MCC-1535.00-00-0089, OSC-9380), "*PRA Quality Self-Assessment, Catawba Units 1 & 2, McGuire Units 1 & 2, Oconee Units 1, 2 & 3*", Revision 2, November 2009.
7. ASME/ANS RA-Sa-2009, "*Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Applications,*" Addendum A to RA-S-2008, ASME, New York, NY, American Nuclear Society, La Grange Park, Illinois, February 2009.
8. NSAC-60, *"A Probabilistic Risk Assessment of Oconee Unit 3",* Cosponsored by Duke Power Company and The Nuclear Safety Analysis Center of the Electric Power Research Institute, Palo Alto, CA, June 1984.
9. "*A Review of the Oconee-3 Probabilistic Risk Assessment, Internal Events, Core Damage Frequency",* Brookhaven National Lab, NUREG/CR-4374 Vol. 1, Pages xv and xvi, Prepared for U.S. Nuclear Regulatory Commission, Washington, D.C., March 1986.
10. "*A Review of the Oconee-3 Probabilistic Risk Assessment, External Events, Core Damage Frequency",* Brookhaven National Lab, NUREG/CR-4374 Vol. 2, Page xiii, Prepared for U.S. Nuclear Regulatory Commission, Washington, D.C., March 1986.
11. NRC Generic Letter 88-20, "*Individual Plant Examination for Severe Accident Vulnerabilities*", US Nuclear Regulatory Commission, November 23, 1988.
12. Letter Duke Power Company to Document Control Desk (USNRC), "*Oconee Units 1, 2, and 3 Individual Plant Examination (IPE) Submittal,*" November 30, 1990.
13. Letter USNRC to Duke Power Company, "*Evaluation of the Oconee, Units 1, 2, and 3 Individual Plant Examination (IPE) – Internal Events Submittal,*" April 1, 1993.
14. NRC Generic Letter 88-20, *"Individual Plant Examination of External Events (IPEEE) for Severe Accident Vulnerabilities 10 CFR 50.54(f), Supplement 4,"* June 28, 1991.

15. Letter Duke Power Company to Document Control Desk (USNRC), Oconee Nuclear Station, "*Individual Plant Examination of External Events (IPEEE) Submittal,*" December 28, 1995.
16. Letter Duke Power Company to Document Control Desk (USNRC), Oconee Nuclear Station, *"Individual Plant Examination of External Events,"* (Supplemental Report -Relay Chatter Analysis), December 18, 1997.
17. Letter Duke Power Company to Document Control Desk (USNRC), *"Oconee IPEEE Analysis- Response to Request for Additional Information dated January 5, 1999,"* March 31, 1999.
18. Letter Duke Power Company to Document Control Desk (USNRC), *"Oconee IPEEE Analysis- Response to Request for Additional Information dated January 5, 1999,"* October 4, 1999.
19. Letter USNRC to Duke Power Company, *"Oconee Nuclear Station Units 1, 2, and 3, RE: Review of Individual Plant Examination of External Events),"* March 15, 2000.
20. Letter Duke Power Company to Document Control Desk (USNRC), *"Oconee Nuclear Site Probabilistic Risk Assessment, Individual Plant Examination,"* (PRA Revision 2), February 13, 1997.
21. *"Oconee Nuclear Station Probabilistic Risk Assessment Peer Review Report,"* Framatome Report No. 38-1288512-00, The BWOG Risk-Informed Assessment Committee, October 2001.
22. *"An Independent Review of the Oconee PRA Against the Requirements of the ASME PRA Standard,"* Rev. 0, Maracor Software & Engineering, Inc., August 31, 2006.
23. Technical Specification Task Force Traveler number TSTF-425, Revision 3, "*Relocate Surveillance Frequencies to Licensee Control – RITSTF Initiative 5,*" July 2009.
24. Regulatory Guide 1.200, "*An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities*", Revision 2, US Nuclear Regulatory Commission, March 2009.
25. OSC-8790, Oconee Nuclear Station, Seismic Analysis Notebook, March 2007.
26. EPRI NP-4726-A, *"Seismic Hazard Methodology for the Central and Eastern United States,"* July 1986.
27. EPRI NP-6041, Revision 1, *"A Methodology of Assessment of Nuclear Power Plant Seismic Margin,"* August 1991.
28. Duke Energy Self Initiated Technical Audit (SITA) GO-03-05 (NPA)(SITA)(ON), Assessment of the Oconee Seismic PRA Analysis, April 2003.
29. OSC-8789, Oconee Nuclear Station, Fire Analysis Notebook, February 2007.
30. Letter Duke Energy Corporation to Document Control Desk (USNRC), *"Letter of Intent to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Generating Plants, 2001 Edition,"* February 28, 2005 (Adams Accession Number ML050670305).
31. Letter USNRC to Duke Energy Corporation, "NRC Response to Duke's Letter of Intent to Adopt 10 CFR 50.48(c) (NFPA 805 Rule)," June 8, 2005 (Adams Accession Number ML051080005).
32. EPRI/NRC-RES, *"Fire PRA Methodology for Nuclear Power Facilities,"* NUREG/CR-6850, EPRI TR-1011989, Final Report, September 2005.
33. ASME/ANS RA-S 2008, "Standard for Level 1/Large Early Release Frequency Probabilistic Risk Assessment for Nuclear Power Plant Application", American

Society of Mechanical Engineers/American Nuclear Society, New York, NY, DRAFT

34. Letter USNRC to Duke Energy Corporation, *"Final Report: Results of the NRC Staff Review of the Oconee Nuclear Station Unit 3, Fire Probabilistic Risk Assessment Model to Support Implementation of National Fire Protection Association Standard NFPA-805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants"* (TAC NO. MC5630), August 7, 2008 (Adams Accession Numbers ML081770653 and ML080940603).
35. Letter Duke Energy Corporation to Document Control Desk (USNRC), Oconee Nuclear Site Units 1, 2, and 3, *"License Amendment Request to Adopt NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Generating Plants (2001 edition)."* May 30, 2008 (Adams Accession Numbers ML081650475 and ML082041014).
36. Letter USNRC to Duke Energy Corporation, *"Summary of Site Audit to Support the Review of a License Amendment Request for Oconee Nuclear Station to Transition to the NFPA 805 Fire Protection Licensing Basis,"* April 6, 2009 (Adams Accession Number ML090900404).
37. NUMARC 91-06, "*Guidelines for Industry Actions to Address Shutdown Management*," December 1991.
38. NSD-403, *"Shutdown Risk Management (Modes 4, 5, 6, and No-Mode) per 10CFR 50.65(a)(4)*," Revision 19, April 2009.

TABLE 2-1
Status of Identified Gaps to Capability Category II
of the ASME PRA Standard
Through Addenda RA-Sc-2007

Title	Description of Gap	Applicable SRs	Current Status / Comment	Importance to 5b Application
Gap #1	Accident sequence notebooks and system model notebooks should document the environmental effects of the initiating event and the impact on mitigation systems.	AS-B3	Open. Phenomenological effects are considered in the model, although these considerations are not always documented.	None – documentation issue.
Gap #2	Revise the data calc. to segregate standby and operating component data. Segregate components by service condition to the extent supported by the data.	DA-B1	Open. Previously, generic data sources often did not provide standby and operating failure rates. NUREG/CR-6928 does provided more of this data, and will be used going forward.	Partitioning the failure rates represents a refinement to the data analysis process, but is not expected to impact the 5b analysis.
Gap #3	Enhance the documentation to include a discussion of the specific checks performed on the Bayesian-updated data, as required by this SR.	DA-D4	Open. As part of the Bayesian update process, checks are performed to assure that the posterior distribution is reasonable given the prior distribution and plant experience. These checks need to be formally documented.	None – documentation issue.
Gap #4	Provide documentation of the comparison of the component boundaries assumed for the generic common cause failure (CCF) estimates to those assumed in the PRA to ensure that these boundaries are consistent.	DA-D6	Open. Generic CCF probabilities are considered for applicability to the plant. CCF probabilities are consistent with plant experience and component boundaries, although the CCF documentation needs to be enhanced to discuss component boundaries.	None – documentation issue.
Gap #5	Enhance the human reliability analysis (HRA) to consider the potential for calibration errors.	HR-A2	Open. Based on evaluations using the EPRI HRA calculator, calibration errors that result in failure of a single	Relative to post-initiator human error probabilities (HEPs), equipment random

Title	Description of Gap	Applicable SRs	Current Status / Comment	Importance to 5b Application
			channel are expected to fall in the low 10^{-3} range.	failure rates and maintenance unavailability, calibration HEPs are not expected to contribute significantly to overall equipment unavailability. Additionally, the next revision of the PRA will incorporate the potential for calibration errors in the HRA. Thus there is no impact on the 5b analysis.
Gap #6	Identify maintenance and calibration activities that could simultaneously affect equipment in either different trains of a redundant system or diverse systems.	HR-A3	Open. Based on evaluations using the EPRI HRA calculator, calibration errors that result in failure of multiple channels are expected to fall in the low 10^{-5} range.	Relative to post-initiator HEPs, latent human error probabilities, equipment random failure rates and maintenance unavailability, calibration HEPs and misalignment of multiple trains of equipment are not expected to contribute significantly to overall equipment unavailability. Thus there is no impact on the 5b analysis.
Gap #7	Develop mean values for pre-initiator HEPs.	HR-D6	Open. Pre-initiator HEPs are generally set to relatively high screening values, which bound the mean values. Even so, pre-initiator HEPs are not significant contributors to risk.	The suggested data refinement is not expected to have a significant impact on the results. Thus there is no impact on the 5b analysis.
Gap #8	Document in more detail the influence of	HR-G3	Open. Performance shaping factors	None – documentation

Title	Description of Gap	Applicable SRs	Current Status / Comment	Importance to 5b Application
	performance shaping factors on execution human error probabilities.		are accounted for in the development of human error probabilities, although detailed documentation is not always available for every HRA input.	issue.
Gap #9	Enhance HRA documentation accordingly.	HR-G4	Open. T/H analyses, simulator runs and operator interviews are used in developing the time available to complete operator actions. The time at which the cue to take action is received is specified in the HEP quantification. However, the HRA documentation needs to be enhanced to provide a traceable path to all analysis inputs.	None – documentation issue.
Gap #10	Document a review of the HFEs and their final HEPs relative to each other to confirm their reasonableness given the scenario context, plant history, procedures, operational practices, and experience.	HR-G6	Open. HFEs are reviewed by knowledgeable site personnel to assure high quality. However, this review needs to be better documented.	None – documentation issue.
Gap #11	Develop mean values for post-initiator HEPs.	HR-G9	Open. The use of mean values for HEPs instead of lower probability median values can affect the PRA results.	The 5b analysis will include a sensitivity study to evaluate the use of different HEPs if the calculated risk is close to the threshold.
Gap #12	Develop more detailed documentation of operator cues, relevant performance shaping factors, and availability of sufficient manpower to perform the action.	HR-H2	Open. Operator recovery actions are credited only if they are feasible, as determined by the procedural guidance, cues, performance shaping factors and available manpower. As noted for HR-G3, -G4, and -G6 above, the documentation of these considerations needs to be enhanced.	None – documentation issue.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Importance to 5b Application
Gap #13	Various enhancements to the internal flood analysis: • Discuss flood mitigative features. • Address the potential for spray, jet impingement, and pipe whip failures. • Provide more analysis of flood propagation flowpaths. Address potential structural failure of doors or walls due to flooding loads and the potential for barrier unavailability. Address potential indirect effects. • Enhance the documentation to address all of the SR details.	IF-B3 IF-C2c IF-C3 IF-C3b IF-E5 IF-E5a IF-E6b IF-F2	Open.	Until the flooding analysis is upgraded, the potential for flood-induced failures of SSCs will be assessed on a case-by-case basis.
Gap #14	Explicitly model RCS depressurization for small LOCAs and perform the dependency analysis on the HEPs.	LE-C6	Open. This issue affects certain small LOCAs. However, since the small LOCA contribution to LERF is small, there is no significant impact on the PRA results.	No impact on the 5b analysis.
Gap #15	Various enhancements to the LERF documentation.	LE-G3 LE-G4 LE-G5 LE-G6	Open.	None – documentation issue.
Gap #16	Perform and document a comparison of PRA results with similar plants.	LE-F3 QU-D3	Open. Comparisons performed for MSPI and other programs help identify causes for significant differences. However, to fully meet this SR, the model quantification documentation needs to be enhanced to provide a results comparison.	None – documentation issues.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Importance to 5b Application
Gap #17	Perform and document sensitivity analyses to determine the impact of the assumptions and sources of model uncertainty on the results.	LE-F2 QU-E4	Open.	Perform and document sensitivity analyses to determine the impact of the assumptions and sources of model uncertainty on the 5b analysis results.
Gap #18	Expand the documentation of the PRA model results to address all required items.	QU-F2 QU-F6	Open. These SRs pertain to the model quantification documentation.	None – documentation issues.
Gap #19	Provide evidence that an acceptability review of the T/H analyses is performed.	SC-B5	Open. Oconee success criteria are consistent with those of sister plants included in the PWROG PSA database. However, to fully meet this SR, the success criteria documentation needs to be enhanced to include a results comparison.	None – documentation issue.
Gap #20	Expand the documentation of the success criteria development to address all required items.	SC-C1 SC-C2	Open. These SRs pertain to the success criteria documentation.	None – documentation issues.
Gap #21	Enhance the system documentation to include an up-to-date system walkdown checklist and system engineer review for each system.	SY-A4	Open. To support system model development, walkdowns and plant personnel interviews were performed. However, documentation of an up-to-date system walkdown is not included with each system notebook.	None – documentation issue.
Gap #22	Enhance systems analysis documentation to discuss component boundaries.	SY-A8	Open. Basic event component boundaries utilized in the systems analysis are consistent with those in the data analysis. In addition, component boundaries are consistent with those defined in the generic failure rate source documents, such as NUREG/CR-6928. Dependencies	None – documentation issue.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Importance to 5b Application
			among components, such as interlocks, are explicitly modeled, consistent with the PRA Modeling Guidelines workplace procedure. There is no evidence of a technical problem with component boundaries, just a need to improve the documentation.	
Gap #23	Provide quantitative evaluations for screening.	SY-A14	Open. It is expected that conversion to a more quantitative approach would not change decisions about whether or not to exclude components or failure modes. A review of our qualitative screening process confirms this expectation. For example, transfer failure events for motor-operated valves (MOVs) with 24 hr exposure times may not be modeled unless probabilistically significant with respect to logically equivalent basic events. For Oconee, the MOV transfers failure probability is less than 1% of the MOV fails to open on demand failure rate. In cases like this, not including the relatively low probability failure mode in the PRA model does not have an appreciable impact on the results.	There is no evidence of a technical problem associated with the screening of components or component failure modes, just a need to document a quantitative screening. Thus there is no impact on the 5b analysis.
Gap #24	Per Duke's PRA modeling guidelines, ensure that a walkdown/system engineer interview checklist is included in each system notebook. Based on the results of the system walkdown, summarize in the system write-up	SY-B8	Open. As noted for SY-A4, walkdowns (which look for spatial and environmental hazards) have been performed, although up-to-date walkdown documentation is not	None – documentation issue.

Title	Description of Gap	Applicable SRs	Current Status / Comment	Importance to 5b Application
	any possible spatial dependencies or environmental hazards that may impact system operation.		included with each system notebook.	
Gap #25	Document a consideration of potential SSC failure due to adverse environmental conditions.	SY-B15	Open. The impact of adverse environmental conditions on SSC reliability is considered but is not always documented. However, there is no evidence of a technical problem associated with components that may be required to operate in conditions beyond their environmental qualification, just a need to improve the documentation.	None – documentation issue.
Gap #26	Enhance system model documentation to comply with all ASME PRA Standard requirements.	SY-C2	Open. This SR pertains to the systems analysis documentation.	None – documentation issue.

Oconee Nuclear Station

Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program (TSTF 425)

License Amendment Request
2009-10

March 2010

ATTACHMENT 3

Technical Specifications and Bases – Mark Ups

INSERT 1

In accordance with the
Surveillance Frequency
Control Program

INSERT 2

5.5.21 Surveillance Frequency Control Program

This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met.

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program.

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1.

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

INSERT 3

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

1.1 Definitions

SHUTDOWN MARGIN (SDM) (continued)	b.	In MODES 1 and 2, the fuel and moderator temperatures are changed to the nominal zero power design level; and
	c.	There is no change in APSR position.
STAGGERED TEST BASIS		A STAGGERED TEST BASIS shall consist of the testing of one of the systems, subsystems, channels, or other designated components during the interval specified by the Surveillance Frequency, so that all systems, subsystems, channels, or other designated components are tested during *n* Surveillance Frequency intervals, where *n* is the total number of systems, subsystems, channels, or other designated components in the associated function.
THERMAL POWER		THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM)

LCO 3.1.1 The SDM shall be within the limit specified in the COLR.

APPLICABILITY: MODES 3, 4, and 5.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SDM not within limit.	A.1 Initiate boration to restore SDM to within limit.	15 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.1.1 Verify SDM is within the limit specified in the COLR.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.2.1	-----------------------NOTES----------------------- The predicted reactivity values may be adjusted (normalized) to correspond to the measured core reactivity prior to exceeding a fuel burnup of 60 effective full power days (EFPD) after each fuel loading. -- Verify measured core reactivity balance is within ±1% Δk/k of predicted values.	Prior to entering MODE 1 after each fuel loading <u>AND</u> ----------NOTE----------- Only required after 60 EFPD ---------------------------- ~~31 EFPD thereafter~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.1.4.1	Verify individual CONTROL ROD positions are within 6.5% of their group average height.	~~12 hours~~ Insert 1
SR 3.1.4.2	Verify CONTROL ROD freedom of movement (trippability) by moving each individual CONTROL ROD that is not fully inserted by an amount in any direction sufficient to demonstrate the absence of thermal binding.	~~92 days~~ Insert 1
SR 3.1.4.3	Verify the rod drop time for each CONTROL ROD, from the fully withdrawn position, is ≤ 1.66 seconds at reactor coolant full flow conditions or ≤ 1.40 seconds at no flow conditions from power interruption at the CONTROL ROD drive breakers to ¾ insertion (25% withdrawn position).	Prior to reactor criticality after each removal of the reactor vessel head

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. More than one safety rod not fully withdrawn.	B.1.1 Verify SDM is within the limit specified in the COLR.	1 hour
	OR	
	B.1.2 Initiate boration to restore SDM to within limit.	1 hour
	AND	
	B.2 Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.5.1 Verify each safety rod is fully withdrawn.	~~12 hours~~ Insert 1

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 AXIAL POWER SHAPING ROD (APSR) Alignment Limits

LCO 3.1.6 Each APSR shall be OPERABLE and aligned within 6.5% of its group average height.

APPLICABILITY: MODES 1 and 2, when the APSRs are not fully withdrawn.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One APSR inoperable, not aligned within its limits, or both.	A.1 Perform SR 3.2.2.1.	2 hours AND 2 hours after each APSR movement
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.6.1	Verify position of each APSR is within 6.5% of the group average height.	~~12 hours~~ Insert 1

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Position Indicator Channels

LCO 3.1.7 One position indicator channel for each CONTROL ROD and APSR shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. The required position indicator channel inoperable for one or more rods.	A.1	Declare the rod(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Perform CHANNEL CHECK of required position indicator channel.	~~12 hours~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. SDM not within limit.	B.1 Initiate boration to restore SDM to within limit. AND B.2 Suspend PHYSICS TESTS exceptions.	15 minutes 1 hour
C. Nuclear overpower trip setpoint is not within limit. OR Nuclear instrumentation wide range high startup rate CONTROL ROD withdrawal inhibit inoperable.	C.1 Suspend PHYSICS TESTS exceptions.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	Verify nuclear overpower trip setpoint is ≤ 5% RTP.	Once within 8 hours prior to performance of PHYSICS TESTS
SR 3.1.8.2	Verify SDM is within the limit specified in the COLR.	24 hours Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.2.1.1	Verify regulating rod groups are within the sequence and overlap limits as specified in the COLR.	12 hours Insert 1
SR 3.2.1.2	Verify regulating rod groups meet the position limits as specified in the COLR.	12 hours
SR 3.2.1.3	Verify SDM to be within the limit as specified in the COLR.	Within 4 hours prior to achieving criticality

3.2 POWER DISTRIBUTION LIMITS

3.2.2 AXIAL POWER IMBALANCE Operating Limits

LCO 3.2.2 AXIAL POWER IMBALANCE shall be maintained within the limits specified in the COLR.

APPLICABILITY: MODE 1 with THERMAL POWER > 40% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. AXIAL POWER IMBALANCE not within limits.	A.1 Restore AXIAL POWER IMBALANCE to within limits.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to ≤ 40% RTP.	2 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify AXIAL POWER IMBALANCE is within limits as specified in the COLR.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify QPT is within limits as specified in the COLR.	7 days Insert 1 <u>AND</u> When QPT has been restored to less than or equal to the steady state limit, 1 hour for 12 consecutive hours, or until verified acceptable at ≥ 95% RTP

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.1-1 to determine which SRs apply to each RPS Function.

	SURVEILLANCE	FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.1.2	---NOTE--- Not required to be performed until 24 hours after THERMAL POWER is ≥ 15% RTP. --- Compare results of calorimetric heat balance calculation to the power range channel output and adjust power range channel output if calorimetric exceeds power range channel output by ≥ 2% RTP.	~~24 hours~~ Insert 1
SR 3.3.1.3	---NOTE--- Not required to be performed until 24 hours after THERMAL POWER is ≥ 15% RTP. --- Compare out of core measured AXIAL POWER IMBALANCE (API_0) to incore measured AXIAL POWER IMBALANCE (API_I) as follows: $(RTP/TP)(API_0 - (CS \times API_I))$ = imbalance error where CS is CORRELATION SLOPE Adjust power range channel output if the absolute value of imbalance error is ≥ 2% RTP.	~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.3.1.4	-----NOTE----- Not applicable to Unit(s) with RPS digital upgrade complete. ----- Perform CHANNEL FUNCTIONAL TEST.	~~45 days on a STAGGERED TEST BASIS~~
SR 3.3.1.5	-----NOTE----- Only applicable to Unit(s) with RPS digital upgrade complete. ----- Manually verify the setpoints are correct.	~~92 days~~
SR 3.3.1.6	-----NOTE----- Only applicable to Unit(s) with RPS digital upgrade complete. ----- Manually actuate the output channel interposing relays.	~~92 days~~ Insert 1
SR 3.3.1.7	-----NOTE----- Neutron detectors are excluded from CHANNEL CALIBRATION. ----- Perform CHANNEL CALIBRATION.	~~18 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Two or more RTCs inoperable in MODE 1, 2, or 3. OR Required Action and associated Completion Time not met in MODE 1, 2, or 3.	B.1 Be in MODE 3. AND B.2.1 Open all CRD trip breakers. OR B.2.2 Remove power from all CRD trip breakers.	12 hours 12 hours 12 hours
C. Two or more RTCs inoperable in MODE 4 or 5. OR Required Action and associated Completion Time not met in MODE 4 or 5.	C.1 Open all CRD trip breakers. OR C.2 Remove power from all CRD trip breakers.	6 hours 6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.3.1 Perform CHANNEL FUNCTIONAL TEST.	~~31 days~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time not met in MODE 1, 2, or 3.	C.1 Be in MODE 3. AND C.2.1 Open all CRD trip breakers. OR C.2.2 Remove power from all CRD trip breakers.	12 hours 12 hours 12 hours
D. Required Action and associated Completion Time not met in MODE 4 or 5.	D.1 Open all CRD trip breakers. OR D.2 Remove power from all CRD trip breakers.	6 hours 6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.4.1	Perform CHANNEL FUNCTIONAL TEST.	~~31 days~~ Insert 1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2.2 -----------NOTE----------- Only required for RCS Pressure – Low Low. ------------------------------	
	Reduce RCS pressure < 900 psig.	36 hours
	AND	
	B.2.3 ----------NOTE------------ Only required for Reactor Building Pressure – High and High High. ------------------------------	
	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	Perform CHANNEL CHECK.	12 ~~hours~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.5.2	-------------------------NOTE-------------------------- Only applicable to Unit(s) with ESPS digital upgrade complete. -- Manually verify that the setpoints are correct.	92 ~~days~~
SR 3.3.5.3	-------------------------NOTE-------------------------- Not applicable to Unit(s) with ESPS digital upgrade complete. -- Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.5.4	Perform CHANNEL CALIBRATION.	18 ~~months~~

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.6.1	Perform CHANNEL FUNCTIONAL TEST.	~~18 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.7.1	------------------------NOTE------------------------ Only applicable to Unit(s) with the ESPS digital upgrade complete -- Manually actuate the output channel interposing relays.	~~92 days~~ Insert 1
SR 3.3.7.2	Perform automatic actuation output logic CHANNEL FUNCTIONAL TEST.	~~92 days for Unit(s) with the ESPS digital upgrade not complete.~~ ~~AND~~ ~~18 months for Unit(s) with the ESPS digital upgrade complete.~~

SURVEILLANCE REQUIREMENTS

---NOTE---

These SRs apply to each PAM instrumentation Function in Table 3.3.8-1 except where indicated.

SURVEILLANCE		FREQUENCY
SR 3.3.8.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	31 days
SR 3.3.8.2	---NOTE--- Only applicable to PAM Functions 7 and 22. --- Perform CHANNEL CALIBRATION.	12 months Insert 1
SR 3.3.8.3	---NOTES--- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. Not applicable to PAM Functions 7 and 22. --- Perform CHANNEL CALIBRATION.	18 months

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.4 Verify SDM to be within the limit specified in the COLR.	1 hour AND Once per 12 hours thereafter
C. One or more required source range neutron flux channel(s) inoperable with THERMAL POWER level > 4E-4% RTP on the wide range neutron flux channels.	C.1 Initiate action to restore affected channel(s) to OPERABLE status.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Perform CHANNEL CHECK.	~~12 hours~~
SR 3.3.9.2	-------------------------NOTE------------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. -- Perform CHANNEL CALIBRATION.	Insert 1 ~~18 months~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.3.10.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.10.2	-------------------------NOTE------------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	Insert 1 18 months
SR 3.3.10.3	Verify at least one decade overlap between source range and wide range neutron flux channels.	Once each reactor startup prior to the source range indication exceeding 10^5 cps if not performed within the previous 7 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Required Action and associated Completion Time of Condition B not met.	C.1 Be in MODE 3. <u>AND</u> C.2 Reduce main steam header pressure to <700 psig.	12 hours 18 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.11.1	Perform CHANNEL CHECK.	~~12 hours~~ Insert 1
SR 3.3.11.2	Perform CHANNEL FUNCTIONAL TEST.	~~31 days~~ Insert 1
SR 3.3.11.3	Perform CHANNEL CALIBRATION.	~~18 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.12.1	Perform CHANNEL FUNCTIONAL TEST.	~~18 months~~ Insert 1

3.3 INSTRUMENTATION

3.3.13 Automatic Feedwater Isolation System (AFIS) Digital Channels

LCO 3.3.13 Two AFIS digital channels per steam generator (SG) shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with main steam header pressure ≥ 700 psig.

ACTIONS

-----NOTE-----
Separate Condition entry is allowed for each SG.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One digital channel inoperable.	A.1 Restore digital channel to OPERABLE status.	72 hours
B. Two digital channels inoperable. <u>OR</u> Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Reduce main steam header pressure to < 700 psig	12 hours 18 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.13.1	Perform CHANNEL FUNCTIONAL TEST.	~~18 months~~ Insert 1

3.3 INSTRUMENTATION

3.3.14 Emergency Feedwater (EFW) Pump Initiation Circuitry

LCO 3.3.14 Two loss of main feedwater (LOMF) pump instrumentation channels for each automatic initiation circuit, and an automatic and manual initiation circuit for each EFW pump shall be OPERABLE.

------------------------------------NOTE------------------------------------
The EFW pump automatic initiation circuit is not required to be OPERABLE in MODES 3 and 4.

APPLICABILITY: MODES 1, 2 and 3,
MODE 4 when the steam generator is relied upon for heat removal.

ACTIONS

--NOTE--
Separate Condition entry is allowed for each EFW pump initiation circuit.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more EFW pump automatic initiation circuits with one LOMF channel inoperable.	A.1 Place channel(s) in trip.	1 hour
B. One or more required EFW pump initiation circuits inoperable. <u>OR</u> Required Action and associated Completion Time not met.	B.1 Declare the affected EFW pump(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.14.1	Perform CHANNEL FUNCTIONAL TEST for each LOMF pump instrumentation channel.	~~31 days~~
SR 3.3.14.2	Perform CHANNEL FUNCTIONAL TEST for each manual initiation circuit.	~~92 days~~
SR 3.3.14.3	Perform CHANNEL FUNCTIONAL TEST for each automatic initiation circuit.	~~18 months~~
SR 3.3.14.4	Perform CHANNEL CALIBRATION for each LOMF pump instrumentation channel.	~~18 months~~

Insert 1

3.3 INSTRUMENTATION

3.3.15 Turbine Stop Valve (TSV) Closure

LCO 3.3.15 Two TSV Closure channels shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3 except when all TSVs are closed.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more TSV Closure channel(s) inoperable.	A.1 Declare the TSVs inoperable.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.15.1 Perform CHANNEL FUNCTIONAL TEST.	~~31 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.16.1	Perform CHANNEL CHECK.	12 ~~hours~~ Insert 1
SR 3.3.16.2	Perform CHANNEL FUNCTIONAL TEST.	Once each refueling outage prior to movement of recently irradiated fuel assemblies within containment
SR 3.3.16.3	Perform CHANNEL CALIBRATION.	18 ~~months~~ Insert 1

3.3 INSTRUMENTATION

3.3.17 Emergency Power Switching Logic (EPSL) Automatic Transfer Function

LCO 3.3.17 Two channels of the EPSL Automatic Transfer Function shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One channel inoperable.	A.1 -----------NOTE----------- The Completion Time is reduced when in Condition L of LCO 3.8.1. ------------------------------- Restore channel to OPERABLE status.	24 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours
	AND	
	B.2 Be in MODE 5.	84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.17.1 Perform CHANNEL FUNCTIONAL TEST.	~~18 months~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met in MODES 1, 2, 3, and 4.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	12 hours 84 hours
C. Two or more channels of a required circuit inoperable when not in MODES 1, 2, 3, and 4. OR Required Action and associated Completion Time not met when not in MODES 1, 2, 3, and 4.	C.1 Declare affected AC power source(s) inoperable.	Immediately
D. Required Action and associated Completion Time not met during movement of irradiated fuel assemblies.	D.1 Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.18.1 Perform CHANNEL FUNCTIONAL TEST.	18 ~~months~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two or more voltage sensing channels inoperable. OR Two actuation logic channels inoperable.	D.1 Declare the overhead emergency power path inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.19.1	Perform a CHANNEL FUNCTIONAL TEST.	18 ~~months~~
		Insert 1
SR 3.3.19.2	Perform a CHANNEL CALIBRATION of the voltage sensing channel with the setpoint allowable value as follows: Degraded voltage ≥ 226 kV and ≤ 229 kV with a time delay of 9 seconds ± 1 second.	18 ~~months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.20.1	Perform a CHANNEL FUNCTIONAL TEST.	~~18 months~~ Insert 1
SR 3.3.20.2	Perform a CHANNEL CALIBRATION of the voltage sensing channel with the setpoint allowable value as follows: a. Degraded voltage ≥ 4143 V and ≤ 4185 V with a time delay of 9 seconds ± 1 second for the first level undervoltage inputs; and b. Degraded voltage ≥ 3871 V and ≤ 3901 V for the second level undervoltage inputs.	~~18 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.21.1	Perform CHANNEL FUNCTIONAL TEST.	~~18 months~~ Insert 1

3.3 INSTRUMENTATION

3.3.22 Emergency Power Switching Logic (EPSL) Manual Keowee Emergency Start Function

LCO 3.3.22 One channel of the EPSL Manual Keowee Emergency Start Function shall be OPERABLE.

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required channel inoperable.	A.1 Declare both Keowee Hydro Units inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.22.1 Perform CHANNEL FUNCTIONAL TEST.	12 months Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time not met.	D.1 Initiate action in accordance with Specification 5.6.6.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.23.1 Perform a CHANNEL FUNCTIONAL TEST.	~~18 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.27.1	Perform CHANNEL CHECK.	~~12 hours~~ Insert 1
SR 3.3.27.2	Perform CHANNEL FUNCTIONAL TEST.	~~92 days~~
SR 3.3.27.3	Perform CHANNEL CALIBRATION.	~~18 months~~

3.3 INSTRUMENTATION

3.3.28 Low Pressure Service Water (LPSW) Standby Pump Auto-Start Circuitry

LCO 3.3.28 LPSW Standby Pump Auto-Start Circuitry shall be OPERABLE.

------------------------------------NOTE------------------------------------
LPSW Standby Pump auto-start circuit is not required to be OPERABLE on running LPSW pumps.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LPSW standby pump auto-start circuitry inoperable.	A.1 Restore LPSW standby pump auto-start circuitry to OPERABLE status.	7 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours
	<u>AND</u>	
	B.2 Be in MODE 5.	60 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.28.1	Perform CHANNEL FUNCTIONAL TEST.	~~18 months~~ Insert 1
SR 3.3.28.2	Perform CHANNEL CALIBRATION.	~~18 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.1.1	-------------------------NOTE------------------------ With three RCPs operating, the limits are applied to the loop with the highest pressure. --- Verify RCS loop pressure is within limits specified in the COLR.	12 ~~hours~~
SR 3.4.1.2	-------------------------NOTE------------------------ With three RCPs operating, the limits are applied to the loop with the lowest loop average temperature for the condition where there is a 0°F ΔTc setpoint. --- Verify RCS loop average temperature is within limits specified in the COLR.	12 ~~hours~~ Insert 1
SR 3.4.1.3	Verify RCS total flow is within limits specified in the COLR.	12 ~~hours~~
SR 3.4.1.4	-------------------------NOTE------------------------ Not required to be performed until 7 days after stable thermal conditions are established in the higher power range of MODE 1. --- Verify by measurement RCS total flow rate is within limit specified in the COLR.	18 ~~months~~

ACTIONS (continued)

*CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	12 hours 36 hours
C. -----------NOTE------------ Required Action C.2 shall be completed whenever this Condition is entered. ------------------------------- Requirements of LCO not met in other than MODE 1, 2, 3, or 4.	C.1 Initiate action to restore parameter(s) to within limit. AND C.2 Determine RCS is acceptable for continued operation.	Immediately Prior to entering MODE 4

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	------------------------NOTE------------------------- Only required to be performed during RCS heatup and cooldown operations and RCS leak and hydrostatic testing. --- Verify RCS pressure, RCS temperature and RCS heatup and cooldown rates are within limits.	~~30 minutes~~ Insert 1

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Loops – MODES 1 and 2

LCO 3.4.4 Two RCS Loops shall be in operation, with:

a. Four reactor coolant pumps (RCPs) operating; or

b. Three RCPs operating and THERMAL POWER restricted to 75% RTP.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of LCO not met.	A.1 Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify required RCS loops are in operation.	12 ~~hours~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Two RCS loops inoperable. OR Required RCS loop not in operation.	C.1	Suspend all operations involving a reduction of RCS boron concentration.	Immediately
	AND		
	C.2	Initiate action to restore one RCS loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify required RCS loop is in operation.	12 hours
SR 3.4.5.2	Verify correct breaker alignment and indicated power available to the required pump that is not in operation.	7 days

Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Two required loops inoperable. <u>OR</u> Required loop not in operation.	B.1 Suspend all operations involving a reduction in RCS boron concentration.	Immediately
	<u>AND</u>	
	B.2 Initiate action to restore one loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Verify required DHR or RCS loop is in operation.	~~12 hours~~ Insert 1
SR 3.4.6.2	Verify correct breaker alignment and indicated power available to the required pump that is not in operation.	~~7 days~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify required DHR loop is in operation.	~~12 hours~~
SR 3.4.7.2	Verify required SG secondary side water levels are ≥ 50%.	~~12 hours~~ Insert 1
SR 3.4.7.3	Verify correct breaker alignment and indicated power available to the required DHR pump that is not in operation.	~~7 days~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Two DHR loops inoperable. OR Required DHR loop not in operation.	B.1	Suspend all operations involving reduction in RCS boron concentration.	Immediately
	AND		
	B.2	Initiate action to restore one DHR loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify required DHR loop is in operation.	~~12 hours~~ Insert 1
SR 3.4.8.2	Verify correct breaker alignment and indicated power available to the required DHR pump that is not in operation.	~~7 days~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
D. Required Action and associated Completion Time of Condition C not met.	D.1	Be in MODE 3.	12 hours
	AND		
	D.2	Reduce RCS temperature to ≤ 325°F.	18 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify pressurizer water level ≤ 285 inches.	~~12 hours~~ Insert 1
SR 3.4.9.2	Verify capacity of required pressurizer heaters and associated power supplies are ≥ 400 kW.	~~18 months~~ Insert 1

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. Gross specific activity of the coolant not within limit.	C.1 Be in MODE 3 with RCS Average Temperature < 500°F.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	Verify reactor coolant gross specific activity $\leq 100/\bar{E}$ μCi/gm.	~~7 days~~ Insert 1
SR 3.4.11.2	----------NOTE---------- Only required to be performed in MODE 1. ---------- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm.	~~14 days~~ Insert 1 AND Between 2 and 6 hours after THERMAL POWER change of ≥ 15% RTP within a 1 hour period
SR 3.4.11.3	----------NOTE---------- Not required to be performed until 31 days after a minimum of 2 EFPD and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours. ---------- Determine $\bar{E}$.	~~184 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	Verify HPI is deactivated.	12 hours Insert 1
SR 3.4.12.2	Verify each CFT is isolated.	12 hours
SR 3.4.12.3	Verify pressurizer level is ≤ level necessary to assure ≥ 10 minutes are available for operator action to mitigate an LTOP event.	30 minutes during RCS heatup and cooldown <u>AND</u> 12 hours Insert 1
SR 3.4.12.4	Verify PORV block valve is open.	12 hours
SR 3.4.12.5	Perform CHANNEL FUNCTIONAL TEST for PORV.	31 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.6	Verify Administrative Controls, other than limits for pressurizer level, that assure ≥ 10 minutes are available for operator action to mitigate an LTOP event are implemented for the following: a. RCS pressure when RCS temperature is < 325°F; b. Makeup flow rate; c. Alarms; d. High pressure Nitrogen System; and e. Verify pressurizer heater bank 3 or 4 is deactivated	~~12 hours~~ Insert 1
SR 3.4.12.7	Perform CHANNEL CALIBRATION for PORV.	~~6 months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.13.1	-------------------------NOTES------------------------ 1. Not required to be performed until 12 hours after establishment of steady state operation. 2. Not applicable to primary to secondary LEAKAGE. --- Evaluate RCS Operational LEAKAGE.	~~72 hours~~ Insert 1
SR 3.4.13.2	-------------------------NOTE------------------------- Not required to be performed until 12 hours after establishment of steady state operation. --- Verify primary to secondary LEAKAGE is ≤ 150 gallons per day through any one SG.	~~72 hours~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.14.1	------------------------NOTE------------------------ Not required to be performed in MODES 3 and 4. --- Verify leakage from each required RCS PIV is equivalent to ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm at an RCS pressure ≥ 2150 psia and ≤ 2190 psia.	~~18 months~~ Insert 1 <u>AND</u> Prior to entering MODE 2 whenever the unit has been in MODE 5 for ≥ 7 days, if leakage testing has not been performed in the previous 9 months.

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of required containment atmosphere radioactivity monitor.	12 hours
SR 3.4.15.2	Perform CHANNEL FUNCTIONAL TEST of required containment atmosphere radioactivity monitor.	92 days Insert 1
SR 3.4.15.3	Perform CHANNEL CALIBRATION of required containment sump level indication.	18 months
SR 3.4.15.4	Perform CHANNEL CALIBRATION of required containment atmosphere radioactivity monitor.	18 months

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.5.1.1	Verify each CFT isolation valve is fully open.	12 ~~hours~~
SR 3.5.1.2	Verify borated water volume in each CFT is $\geq$ 1010 ft^3 and $\leq$ 1070 ft^3.	12 ~~hours~~ Insert 1
SR 3.5.1.3	Verify nitrogen cover pressure in each CFT is $\geq$ 575 psig and $\leq$ 625 psig.	12 ~~hours~~
SR 3.5.1.4	Verify boron concentration in each CFT is within the limit specified in the COLR.	31 ~~days~~ AND ----------NOTE------------ Only required to be performed for affected CFT ---------------------------- Once within 12 hours after each solution volume increase of $\geq$ 80 gallons that is not the result of addition from a borated water source that meets CFT boron concentration requirements.
SR 3.5.1.5	Verify power is removed from each CFT isolation valve operator.	31 ~~days~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
F. One LPI-HPI flow path inoperable.	F.1	Restore LPI-HPI flow path to OPERABLE status.	72 hours
G. Required Action and associated Completion Time of Condition B, C, D, E, or F not met.	G.1	Be in MODE 3.	12 hours
	AND		
	G.2	Reduce RCS temperature to ≤ 350°F.	60 hours
H. Two HPI trains inoperable. OR Two LPI-HPI flow paths inoperable.	H.1	Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify each HPI manual and non-automatic power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.5.2.2	-------------------------NOTE-------------------------- Not applicable to operating HPI pump(s). -- Vent each HPI pump casing.	Insert 1 ~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.3	Verify each HPI pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.5.2.4	Verify each HPI automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~
SR 3.5.2.5	Verify each HPI pump starts automatically on an actual or simulated actuation signal.	~~18 months~~ Insert 1
SR 3.5.2.6	Verify, by visual inspection, each HPI train reactor building sump suction inlet is not restricted by debris and suction inlet strainers show no evidence of structural distress or abnormal corrosion.	~~18 months~~
SR 3.5.2.7	Cycle each HPI discharge crossover valve and LPI-HPI flow path discharge valve.	~~18 months~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met.	C.1	Be in MODE 3.	12 hours
	<u>AND</u>		
	C.2	Be in MODE 4.	60 hours
D. One required LPI train inoperable in MODE 4.	D.1	Initiate action to restore required LPI train to OPERABLE status.	Immediately
	<u>AND</u>		
	D.2	----------NOTE----------- Only required if DHR loop is OPERABLE. --------------------------- Be in MODE 5.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	Verify each LPI manual and non-automatic power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 ~~days~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.3.2	------------------------NOTE------------------------ Not applicable to operating LPI pump(s). -- Vent each LPI pump casing.	31 days Insert 1
SR 3.5.3.3	Verify each LPI pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.5.3.4	Verify each LPI automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	18 months Insert 1
SR 3.5.3.5	Verify each LPI pump starts automatically on an actual or simulated actuation signal.	18 months
SR 3.5.3.6	Verify, by visual inspection, each LPI train reactor building sump suction inlet is not restricted by debris and suction inlet strainers show no evidence of structural distress or abnormal corrosion.	18 months

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	-------------------------NOTE------------------------- Only required to be performed when ambient air temperature is < 45°F or > 115°F. --- Verify BWST borated water temperature is ≥ 45°F and ≤ 115°F.	~~24 hours~~
SR 3.5.4.2	Verify BWST borated water volume is ≥ 350,000 gallons.	~~7 days~~ Insert 1
SR 3.5.4.3	Verify BWST boron concentration is: a. Within limits specified in the COLR; AND b. $\geq$ 2220 ppm.	~~7 days~~

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.2.1	-------------------------NOTES------------------------ 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria of SR 3.6.1.2 in accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions. -- Perform required air lock leakage rate testing in accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions.	------------NOTE------------ SR 3.0.2 is not applicable ---------------------------------- In accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions
SR 3.6.2.2	Verify only one door in the air lock can be opened at a time.	~~18 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.3.1	Verify each 48 inch purge valve is sealed closed.	31 ~~days~~
SR 3.6.3.2	-------------------------NOTE------------------------- Valves and blind flanges in high radiation areas may be verified by use of administrative means. --- Verify each containment isolation manual and non-automatic power operated valve and blind flange that is located outside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	Insert 1 ~~31 days~~
SR 3.6.3.3	-------------------------NOTE------------------------- Valves and blind flanges in high radiation areas may be verified by use of administrative means. --- Verify each containment isolation manual and non-automatic power operated valve and blind flange that is located inside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.4	Verify the isolation time of each automatic power operated containment isolation valve is within limits.	In accordance with the Inservice Testing Program
SR 3.6.3.5	Verify each automatic containment isolation valve that is not locked, sealed, or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	18 ~~months~~ $\boxed{\text{Insert 1}}$

3.6 CONTAINMENT SYSTEMS

3.6.4 Containment Pressure

LCO 3.6.4 Containment pressure shall be ≥ -2.45 psig and ≤ +1.2 psig.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment pressure not within limits.	A.1 Restore containment pressure to within limits.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. <u>AND</u> B.2 Be in MODE 5.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.4.1	Verify containment pressure is within limits.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.5.1	------------------NOTE------------------ Applicable for RB cooling system after the completion of the LPSW RB Waterhammer Modification on the respective Unit. -- Verify each reactor building spray and cooling manual and non-automatic power operated valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	31 ~~days~~
SR 3.6.5.2	Operate each required reactor building cooling train fan unit for ≥ 15 minutes.	31 ~~days~~ Insert 1
SR 3.6.5.3	Verify each required reactor building spray pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.6.5.4	Verify that the containment heat removal capability is sufficient to maintain post accident conditions within design limits.	18 ~~months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.5.5	-----------------------NOTE----------------------- Applicable for RB cooling system after the completion of the LPSW RB Waterhammer Modification on the respective Unit. -- Verify each automatic reactor building spray and cooling valve in each required flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	18 ~~months~~
SR 3.6.5.6	Verify each required reactor building spray pump starts automatically on an actual or simulated actuation signal.	18 ~~months~~
SR 3.6.5.7	Verify each required reactor building cooling train starts automatically on an actual or simulated actuation signal.	18 ~~months~~
SR 3.6.5.8	Verify each spray nozzle is unobstructed.	10 ~~years~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.2.1	-------------------------NOTE------------------------- Only required to be performed in MODES 1 and 2. --- Verify closure time of each TSV is ≤ 1.0 seconds on an actual or simulated actuation signal from Channel A.	~~18 months~~ Insert 1
SR 3.7.2.2	-------------------------NOTE------------------------- Only required to be performed in MODES 1 and 2. --- Verify closure time of each TSV is ≤ 1.0 second on an actual or simulated actuation signal from Channel B.	~~18 months~~

3.7 PLANT SYSTEMS

3.7.4 Atmospheric Dump Valve (ADV) Flow Paths

LCO 3.7.4 The ADV flow path for each steam generator shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3, and MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or both ADV flow path(s) inoperable.	A.1 Be in MODE 3. <u>AND</u> A.2 Be in MODE 4 without reliance upon steam generator for heat removal.	12 hours 24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Cycle the valves that comprise the ADV flow paths.	~~18 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.5.1	Verify each EFW manual, and non-automatic power operated valve in each water flow path and in the steam supply flow path to the turbine driven pump, that is not locked, sealed, or otherwise secured in position, is in the correct position.	31 days
SR 3.7.5.2	Verify the developed head of each EFW pump at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.7.5.3	-------------------------NOTE------------------------ Not required to be met in MODES 3 and 4. --- Verify each EFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	Insert 1 18 months
SR 3.7.5.4	-------------------------NOTE------------------------- Not required to be met in MODES 3 and 4. --- Verify each EFW pump starts automatically on an actual or simulated actuation signal.	18 months
SR 3.7.5.5	Verify proper alignment of the required EFW flow paths by verifying valve alignment from the upper surge tank to each steam generator.	Prior to entering MODE 2 whenever unit has been in MODE 5 or 6 for > 30 days

3.7 PLANT SYSTEMS

3.7.6 Upper Surge Tank (UST) and Hotwell (HW)

LCO 3.7.6 The UST and HW shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of the LCO not met.	A.1 Be in MODE 3. <u>AND</u> A.2 Be in MODE 4 without reliance on steam generator for heat removal.	12 hours 24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify combined inventory in the UST and HW is ≥ 155,000 gal. <u>AND</u> Inventory in the UST is ≥ 30,000 gal.	~~12 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	Verify LPSW leakage accumulator level is within Water levels between 20.5" to 41" for Units with LPSW RB Waterhammer modification installed. During LPSW testing, accumulator level > 41" is acceptable.	~~12 hours~~
SR 3.7.7.2	-------------------------NOTE------------------------- Isolation of LPSW flow to individual components does not render the LPSW System inoperable. --- Verify each LPSW manual, and non-automatic power operated valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	~~31 days~~
SR 3.7.7.3	Verify each LPSW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	~~18 months~~
SR 3.7.7.4	Verify each LPSW pump starts automatically on an actual or simulated actuation signal.	~~18 months~~
SR 3.7.7.5	Verify LPSW leakage accumulator is able to provide makeup flow lost due to boundary valve leakage on Units with LPSW RB Waterhammer modification installed.	~~18 months~~

Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.7.6	Verify LPSW WPS boundary valve leakage is ≤ 20 gpm for Units with LPSW RB Waterhammer modification installed.	~~18 months~~ Insert 1

3.7 PLANT SYSTEMS

3.7.8 Emergency Condenser Circulating Water (ECCW) System

LCO 3.7.8 Two ECCW siphon headers shall be OPERABLE.

------------------------------NOTE------------------------------
Not applicable on each Unit until after completion of the Service Water upgrade modifications on the respective Unit.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required ECCW siphon header inoperable.	A.1 Restore required ECCW siphon header to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	12 hours 60 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify required Essential Siphon Vacuum (ESV) pumps are in operation.	12 ~~hours~~ Insert 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.8.2	Verify Keowee Lake water level is within limits.	~~24 hours~~
SR 3.7.8.3	Verify average water temperature of Condenser Circulating Water (CCW) inlet is ≤ 90°F.	~~24 hours~~
SR 3.7.8.4	Verify each manual and non-automatic power operated valve in each ECCW siphon header flow path, required ESV flow paths and required SSW flow paths that is not locked, sealed, or otherwise secured in position is in the correct position.	~~31 days~~ INSERT 1
SR 3.7.8.5	Verify upon an actual or simulated actuation signal each ESV float valve actuates to the correct position.	~~92 days~~
SR 3.7.8.6	Verify upon an actual or simulated actuation signal each required ESV and Siphon Seal Water (SSW) valve actuates to the correct position.	~~92 days~~
SR 3.7.8.7	Verify the developed capacity of each required ESV pump at the test point is greater than or equal to the required capacity.	~~92 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.8.8	Verify each required ESV pump automatically starts in ≤ 1200 seconds upon an actual or simulated restoration of emergency power.	~~92 days~~
SR 3.7.8.9	------------------------NOTE-------------------------- Not required to be performed for Units 1 and 2 with the shared Unit 1 and 2 LPSW System taking suction from the siphon. -- Verify upon an actual or simulated trip of the CCW pumps and ESV pumps that the rate of water level drop in the ECCW siphon header is within limits.	INSERT 1 ~~18 months~~

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time not met in MODE 1, 2, 3, or 4.	D.1 Be in MODE 3. AND D.2 Be in MODE 5	12 hours 36 hours
E. Required Action and associated Completion Time not met during movement of recently irradiated fuel assemblies.	E.1 Suspend movement of recently irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Operate each CRVS Booster Fan train for ≥ 1 hour.	~~92 days~~ Insert 1
SR 3.7.9.2	Perform required CRVS Booster Fan train filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.9.3	Verify two CRVS Booster Fan trains can maintain the Control Room at a positive pressure.	~~18 months~~

3.7 PLANT SYSTEMS

3.7.11 Spent Fuel Pool Water Level

LCO 3.7.11 The Spent Fuel Pool water level shall be ≥ 21.34 ft over the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: During movement of irradiated fuel assemblies in the Spent Fuel Pool, During movement of cask over the Spent Fuel Pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spent Fuel Pool water level not within limit.	------------------NOTE------------------ LCO 3.0.3 is not applicable. --	
	A.1 Suspend movement of irradiated fuel assemblies in Spent Fuel Pool.	Immediately
	<u>AND</u>	
	A.2 Suspend movement of cask over Spent Fuel Pool.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.11.1	Verify the Spent Fuel Pool water level is ≥ 21.34 ft above the top of irradiated fuel assemblies seated in the storage racks.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.1	Verify the spent fuel pool boron concentration is: a. Within limits specified in the COLR; AND b. ≥ 2220 ppm.	~~7 days~~ Insert 1

3.7 PLANT SYSTEMS

3.7.14 Secondary Specific Activity

LCO 3.7.14 The specific activity of the secondary coolant shall be $\leq$ 0.10 μCi/gm DOSE EQUIVALENT I-131.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Specific activity not within limit.	A.1 Be in MODE 3. AND A.2 Be in MODE 5.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.14.1 Verify the specific activity of the secondary coolant is $\leq$ 0.10 μCi/gm DOSE EQUIVALENT I-131.	~~31 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify temperature in Control Room and Cable Room is ≤ 80°F and temperature in Electrical Equipment Room is ≤ 85°F.	~~12 hours~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
M. Required Action and associated Completion Time for Condition C, F, G, H, I, J, K or L not met. OR Required Action and associated Completion Time not met for Required Action D.1 or D.3.	M.1 Be in MODE 3. AND M.2 Be in MODE 5.	12 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each required offsite source.	~~7 days~~
SR 3.8.1.2	Verify battery terminal voltage is ≥ 125 V on float charge for each KHU's battery.	~~7 days~~ Insert 1
SR 3.8.1.3	Verify the KHU associated with the underground emergency power path starts automatically and energizes the underground emergency power path. Manually close the SK breaker to each de-energized standby bus.	~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.4	-----NOTE----- The requirement to energize the underground emergency power path is not applicable 1) when the overhead disconnects are open for the KHU associated with the underground emergency power path or 2) when complying with Required Action D.1. ----- Verify the KHU associated with the overhead emergency power path starts automatically and automatically or manually synchronize it to the Yellow bus in 230 kV switchyard. Energize the underground emergency power path after removing the KHU from the overhead emergency power path.	~~31 days~~ Insert 1
SR 3.8.1.5	-----NOTE----- Not required to be performed for an SL breaker when its standby bus is energized from a LCT via an isolated power path. ----- Verify each closed SL and each closed N breaker opens manually or on an actual or simulated actuation signal.	~~31 days~~
SR 3.8.1.6	-----NOTE----- Not required to be performed for an S breaker when its standby bus is energized from a LCT via an isolated power path. ----- Operate each S and each E breaker through a full cycle.	~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	Verify both KHU's underground tie breakers cannot be closed simultaneously.	12 ~~months~~
SR 3.8.1.8	Verify each KHU's overhead emergency power path tie breaker cannot be closed when tie breaker to underground emergency power path is closed.	12 ~~months~~
SR 3.8.1.9	Verify on an actual or simulated emergency actuation signal each KHU auto starts and: a. Achieves frequency ≥ 57 Hz and ≤ 63 Hz and voltage ≥ 13.5 kV and ≤ 14.49 kV in ≤ 23 seconds; and b. Supplies the equivalent of one Unit's Loss of Coolant Accident (LOCA) loads plus two Unit's Loss of Offsite Power (LOOP) loads when synchronized to system grid and loaded at maximum practical rate.	12 ~~months~~ Insert 1
SR 3.8.1.10	Verify each KHU's battery capacity is adequate to supply, and maintain in OPERABLE status, required emergency loads for design duty cycle when subjected to a battery service test.	12 ~~months~~
SR 3.8.1.11	Verify each KHU's battery cells, cell end plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	12 ~~months~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	Verify each KHU's battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.	12 ~~months~~
SR 3.8.1.13	-----NOTE----- Only applicable when the overhead electrical disconnects for the KHU associated with the underground emergency power path are closed. ----- Verify on an actual or simulated zone overlap fault signal each KHU's overhead tie breaker and underground tie breaker actuate to the correct position.	12 ~~months~~
SR 3.8.1.14	-----NOTE----- Not required to be performed for an SL breaker when its standby bus is energized from a LCT via an isolated power path. ----- Verify each closed SL and closed N breaker opens on an actuation of each redundant trip coil.	~~18 months~~
SR 3.8.1.15	~~-----NOTE----- Redundant breaker trip coils shall be verified on a STAGGERED TEST BASIS. -----~~ Verify each 230 kV switchyard circuit breaker actuates to the correct position on a switchyard isolation actuation signal.	18 ~~months~~

INSERT 1

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.16	------------------------NOTE------------------------ Only applicable when complying with Required Action C.2.2.4. --- Verify one KHU provides an alternate manual AC power source capability by manual or automatic KHU start with manual synchronize, or breaker closure, to energize its non-required emergency power path.	As specified by Required Action C.2.2.4
SR 3.8.1.17	Verify each KHU's Voltage and Frequency out of tolerance logic trips and blocks closure of the appropriate overhead or underground power path breakers. The allowable values with a time delay of 5 seconds ± 1 second shall be as follows: a. Undervoltage ≥ 12.42 kV and ≤ 12.63 kV b. Overvoltage ≥ 14.90 kV and ≤ 15.18 kV c. Underfrequency ≥ 53.992 hz and ≤ 54.008 hz d. Overfrequency ≥ 65.992 hz and ≤ 66.008 hz	~~18 months~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.3.1	Verify correct breaker alignments and voltage availability from required distribution centers to isolating transfer diodes.	~~7 days~~
SR 3.8.3.2	Verify battery terminal voltage is ≥ 125V on float charge.	~~7 days~~
SR 3.8.3.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	~~12 months~~ INSERT 1
SR 3.8.3.4	Verify battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.	~~12 months~~
SR 3.8.3.5	Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	~~12 months~~
SR 3.8.3.6	Verify battery capacity is in accordance with the Battery Discharge Testing Program.	In accordance with the Battery Discharge Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.5.1	Verify battery cell parameters meet Table 3.8.5-1 Category A limits.	~~7 days~~
SR 3.8.5.2	Verify battery cell parameters meet Table 3.8.5-1 Category B limits.	~~92 days~~ Insert 1
SR 3.8.5.3	Verify average electrolyte temperature of representative cells is ≥ 60°F.	~~92 days~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	Verify correct inverter voltage, frequency, and alignment to required 120 VAC Vital Instrumentation power panelboards.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.7.1	Verify correct inverter voltage, frequency, and alignments to required 120 VAC Vital Instrumentation power panelboards.	~~7 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
3.8.8.1	Verify correct breaker alignments and voltage to required main feeder buses.	7 ~~days~~ Insert 1
3.8.8.2	Verify correct breaker alignments and voltage availability to required ES power strings, 125 VDC Vital I&C power panelboards, 230 kV Switchyard 125 VDC power panelboards and 120 VAC Vital Instrumentation power panelboards.	7 ~~days~~

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Initiate actions to restore required main feeder buses, ES power strings, 125 VDC Vital I&C power panelboards, 230 kV Switchyard 125 VDC power panelboards or 120 VAC Vital Instrumentation power panelboards to OPERABLE status.	Immediately
	AND	
	A.2.5 Declare associated required decay heat removal loop(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.9.1	Verify correct breaker alignments and voltage to required main feeder buses.	~~7 days~~ Insert 1
SR 3.8.9.2	Verify correct breaker alignments and voltage availability to required ES power strings, 125 VDC Vital I&C power panelboards, 230 kV Switchyard 125 VDC power panelboards and 120 VAC Vital Instrumentation power panelboards.	~~7 days~~

3.9 REFUELING OPERATIONS

3.9.1 Boron Concentration

LCO 3.9.1 Boron concentrations of the Reactor Coolant System and the refueling canal shall be maintained within the limit specified in the COLR.

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Boron concentration not within limit.	A.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2 Suspend positive reactivity additions.	Immediately
	AND	
	A.3 Initiate action to restore boron concentration to within limit.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Verify boron concentration is within the limit specified in the COLR.	~~72 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.2.1	Perform CHANNEL CHECK.	12 ~~hours~~
SR 3.9.2.2	------------------------NOTE------------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	Insert 1 18 ~~months~~

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify each required containment penetration is in the required status.	~~7 days~~ Insert 1
SR 3.9.3.2	Verify each required Reactor Building Purge supply and exhaust isolation valve that is not locked, sealed or otherwise secured in the isolation position actuates to the isolation position on an actual or simulated high radiation actuation signal.	Once each refueling outage prior to movement of recently irradiated fuel assemblies within containment

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.4 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.9.4.1 Verify one DHR loop is in operation.	~~12 hours~~ Insert 1

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.5.1	Verify one DHR loop is in operation.	12 ~~hours~~
SR 3.9.5.2	Verify correct breaker alignment and indicated power available to the required DHR pump that is not in operation.	7 ~~days~~

Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify fuel transfer canal water level is ≥ 21.34 ft above the top of reactor vessel flange.	~~24 hours~~ Insert 1

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify each valve that isolates unborated water sources is secured in the closed position.	~~31 days~~ Insert 1

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.10.1.1	---------------------NOTE--------------------- Not applicable to RCS temperature instrument channels. --- Perform CHANNEL CHECK for each required SSF instrument channel.	7 ~~days~~
SR 3.10.1.2	Verify required SSF battery terminal voltage is ≥ 125 VDC on float charge.	7 ~~days~~
SR 3.10.1.3	Verify the day tank contains ≥ 200 gallons of fuel.	~~31 days~~ Insert 1
SR 3.10.1.4	Verify the underground oil storage tank contains ≥ 25,000 gallons of fuel.	~~31 days~~
SR 3.10.1.5	---------------------NOTE--------------------- All DG starts may be preceded by an engine prelube period followed by a warmup period prior to loading. --- Verify the DG starts from standby conditions and achieves steady state voltage and frequency.	~~31 days~~
SR 3.10.1.6	Verify DG required air start receiver pressure is ≥ 150 psig.	~~31 days~~

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.10.1.7	Verify the fuel oil transfer system operates to automatically transfer fuel oil from the storage tank to the day tank.	92 days
SR 3.10.1.8	Verify the fuel oil properties of the fuel oil stored in the day tank and underground storage tank are tested in accordance with, and maintained within the limits of the Diesel Fuel Oil Testing Program.	92 days
SR 3.10.1.9	-------------------NOTES------------------- 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. All DG starts may be preceded by an engine prelube period followed by a warmup period prior to loading. -- Verify the SSF DG is synchronized and loaded and operated for ≥ 60 minutes at a load ≥ 3280 kW.	Insert 1 92 days
SR 3.10.1.10	Verify for required SSF battery that the cells, cell plates and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	12 months

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.10.1.11	Verify for required SSF battery that the cell to cell and terminal connections are clean, tight and coated with anti-corrosion material.	12 ~~months~~
SR 3.10.1.12	Verify battery capacity of required battery is adequate to supply, and maintain in OPERABLE status, the required maximum loads for the design duty cycle when subjected to a battery service test.	12 ~~months~~ Insert 1
SR 3.10.1.13	Perform CHANNEL CALIBRATION for each required SSF instrument channel.	18 ~~months~~
SR 3.10.1.14	Verify OPERABILITY OF SSF valves in accordance with the Inservice Testing Program.	In accordance with the Inservice Testing Program
SR 3.10.1.15	---------------------NOTE--------------------------- Not applicable to the SSF submersible pump. --- Verify the developed head of each required SSF pump at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.10.1.16	Verify the developed head of the SSF submersible pump at the flow test point is greater than or equal to the required developed head.	2 ~~years~~ Insert 1

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. OR Required SSF battery with average electrolyte temperature of the representative cells < 60°F. OR Required SSF battery with one or more battery cell parameters not within Category C values.	B.1 Declare SSF Power System inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.2.1	Verify battery cell parameters meet Table 3.10.2-1 Category A limits.	~~7 days~~
SR 3.10.2.2	Verify battery cell parameters meet Table 3.10.2-1 Category B limits.	~~92 days~~ Insert 1
SR 3.10.2.3	Verify average electrolyte temperature of representative cells is ≥ 60°F.	~~92 days~~

5.5 Programs and Manuals

5.5.16 Safety Function Determination Program (SFDP) (continued)

A loss of safety function exists when, assuming no concurrent single failure, a safety function assumed in the accident analysis cannot be performed. For the purpose of this program, a loss of safety function may exist when a support system is inoperable, and:

a. A required system redundant to the system(s) supported by the inoperable support system is also inoperable; or

b. A required system redundant to the system(s) in turn supported by the inoperable supported system is also inoperable; or

c. A required system redundant to the support system(s) for the supported systems (a) and (b) above is also inoperable.

The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

5.5.17 Backup Method for Determining Subcooling Margin

This program ensures the capability to accurately monitor the Reactor Coolant System Subcooling Margin. The program shall include the following:

a. Training of personnel, and

b. Procedures for monitoring.

5.5.18 KHU Commercial Power Generation Testing Program

The KHU Commercial Power Generation Testing Program shall include the following and shall be met during periods of KHU commercial power generation:

a. Verify upon an actual or simulated actuation signal, each KHU's overhead tie breaker and underground tie breaker actuate to the correct position from an initial condition of commercial power generation ~~every 18 months~~

b. Verify upon an actual or simulated actuation signal, each KHU's frequency is $\leq$ 66 Hz in $\leq$ 23 seconds from an initial condition of commercial power generation ~~every 18 months~~

in accordance with the Surveillance Frequency Control Program

5.5 Programs and Manuals

5.5.18 KHU Commercial Power Generation Testing Program (continued)

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the KHU Commercial Power Generation Testing Program surveillance frequencies.

5.5.19 Lee Combustion Turbine Testing Program

The Lee Combustion Turbine (LCT) Testing program shall include the following and shall be met when a LCT is used to comply with Required Actions of Specification 3.8.1, "AC Sources-Operating" or as a emergency power source as allowed by LCO 3.8.2, "AC Sources-Shutdown":

a. Verify an LCT can energize both standby buses using 100kV line electrically separated from system grid and offsite loads ~~every 12 months~~.

b. Verify an LCT can supply equivalent of one Unit's Loss of Coolant Accident (LOCA) loads plus two Unit's Loss of Offsite Power (LOOP) loads when connected to system grid ~~every 12 months~~.

c. Verify an LCT can provide equivalent of one Unit's LOCA loads within one hour through 100kV line electrically separated from system grid and offsite loads ~~every 18 months~~. in accordance with the Surveillance Frequency Control Program

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Lee Combustion Turbine Testing Program surveillance frequencies.

5.5.20 Battery Discharge Testing Program

The Battery Discharge Testing Program shall include the following and shall be met for batteries used to comply with LCO 3.8.3, "DC Sources Operating."

a. Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test ~~once every 60 months~~. This frequency shall be reduced to 12 months when battery shows degradation, or has reached 90% of the expected life with capacity < 100% of manufacturer's rating, and 24 months when battery has reached 90% of the expected life with capacity ≥ 100% of manufacturer's rating.

5.5 Programs and Manuals

5.5.20 Battery Discharge Testing Program (continued)

b. If battery capacity is determined to be < 80% of the manufacturer's rating an OPERABILITY evaluation shall be initiated immediately and completed within the guidelines of the Oconee OPERABILITY program. If the OPERABILITY evaluation determines the battery OPERABLE, battery capacity shall be restored to ≥ 80% of the manufacturer's rating within a time frame commensurate with the safety significance of the issue. Otherwise, the battery shall be declared inoperable and the applicable Condition of Specification 3.8.3 shall be entered.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Battery Discharge Testing Program surveillance frequencies.

Insert 2

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1

The SDM is verified by performing a reactivity balance calculation, considering the listed reactivity effects:

a. RCS boron concentration;

b. CONTROL ROD position;

c. RCS average temperature;

d. Fuel burnup;

e. Xenon concentration;

f. Samarium concentration; and

g. Overall temperature coefficient.

Operators verify that the existing boron concentration in the RCS meets SDM requirements using a SDM curve.

Insert 3

~~The Frequency of 24 hours is based on the generally slow change in required boron concentration, and also allows sufficient time for the operator to collect the required data, which may include performing a boron concentration analysis.~~

REFERENCES

1. UFSAR, Section 3.1.

2. UFSAR, Chapter 15.

3. UFSAR, Section 15.12.

4. 10 CFR 50.36.

5. 10 CFR 100, "Reactor Site Criteria."

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.2.1

Core reactivity is verified by periodic reactivity balance calculations that compares the predicted core reactivity to the actual core reactivity condition (net reactivity of zero condition). The comparison is made considering that other core conditions are fixed or stable, including CONTROL ROD and APSR positions, moderator temperature, fuel temperature, fuel depletion, xenon concentration, and samarium concentration. The Surveillance is performed once prior to entering MODE 1, after each fuel loading as an initial check on core reactivity conditions and design calculations at BOC. A Note is included in the SR to indicate that the normalization of predicted core reactivity to the measured value may take place within the first 60 effective full power days (EFPD) after each fuel loading. ~~The required Frequency of 31 EFPD, following the initial 60 EFPD after entering MODE 1 is acceptable, based on the slow rate of core reactivity changes due to fuel depletion and the presence of other indicators (QPT, etc.) for prompt indication of an anomaly.~~ The 60 EFPD after entering MODE 1 allows sufficient time for core conditions to reach steady state but prevents operation for a large fraction of the fuel cycle without establishing a benchmark for the design calculations. The subsequent Surveillance Frequency is based on operating experience, equipment reliability, and plant risks and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 3.1.
2. UFSAR, Chapter 15.
3. 10 CFR 50.36.

BASES

ACTIONS

D.2 (continued)

The allowed Completion Time is reasonable, based on operating experience, for reaching MODE 3 from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.4.1

Verification that individual CONTROL RODS are aligned within 6.5% of their group average height limits at a 12 hour Frequency allows the operator to detect a rod that is beginning to deviate from its expected position. The specified Frequency takes into account other CONTROL ROD position information that is continuously available to the operator in the control room, so that during actual CONTROL ROD motion, deviations can immediately be detected.

Insert 3

SR 3.1.4.2

Verifying each CONTROL ROD is OPERABLE would require that each rod be tripped. However, in MODES 1 and 2, tripping each CONTROL ROD could result in radial tilts. Exercising each individual CONTROL ROD every 92 days provides increased confidence that all rods continue to be OPERABLE without exceeding the alignment limit, even if they are not regularly tripped. Moving each CONTROL ROD by an amount in any direction sufficient to demonstrate the absence of mechanical binding will not cause radial or axial power tilts, or oscillations, to occur. The 92 day Frequency takes into consideration other information available to the operator in the control room and SR 3.1.4.1, which is performed more frequently and adds to the determination of OPERABILITY of the rods. Between required performances of SR 3.1.4.2 (determination of CONTROL ROD OPERABILITY by movement), if a CONTROL ROD(S) is discovered to be immovable, but is determined to be trippable and aligned, the CONTROL ROD(S) is considered to be OPERABLE. At any time, if a CONTROL ROD(S) is immovable, a determination of the trippability (OPERABILITY) of the CONTROL ROD(S) must be made, and appropriate action taken.

SR 3.1.4.3

Verification of CONTROL ROD drop time allows the operator to determine that the maximum CONTROL ROD drop time permitted is consistent with the assumed CONTROL ROD drop time used in the safety analysis. The

Amendment Nos.

BASES

ACTIONS

B.1.1 and B.1.2 (continued)

In this situation, SDM verification must include the worth of the untrippable rod(s) as well as the CONTROL ROD of maximum worth.

B.2

If more than one safety rod is not fully withdrawn the unit must be brought to a MODE where the LCO is not applicable. The allowed Completion Time of 12 hours is reasonable, based on operating experience, for reaching the required MODE from RTP in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1

Verification that each safety rod is fully withdrawn ensures the safety rods are available to provide reactor shutdown capability.

Verification that individual safety rod positions are fully withdrawn ~~at a 12 hour Frequency~~ allows the operator to detect a safety rod beginning to deviate from its expected position. ~~Also, the 12 hour Frequency takes into account other information available in the control room for the purpose of monitoring the status of the safety rods.~~

Insert 3

REFERENCES

1. UFSAR, Section 3.1.
2. 10 CFR 50.46.
3. UFSAR, Chapter 3.
4. 10 CFR 50.36.

BASES

ACTIONS

A.1 (continued)

For Unit(s) with the CRDCS digital upgrade not complete, an alternative to realigning a single inoperable or misaligned APSR to the group average position is to align the remainder of the APSR group to the position of the inoperable or misaligned APSR. This restores the alignment requirements. Deviations up to 2 hours will not cause significant xenon redistribution to occur.

The reactor may continue in operation with the APSR inoperable or misaligned if the limits on AXIAL POWER IMBALANCE are surveilled within 2 hours to determine if the AXIAL POWER IMBALANCE is still within limits. Also, since any additional movement of the APSRs may result in additional imbalance, Required Action A.1 also requires the AXIAL POWER IMBALANCE surveillance to be performed again within 2 hours after each APSR movement. The required Completion Time of up to 2 hours will not cause significant xenon redistribution to occur.

B.1

The unit must be brought to a MODE in which the LCO does not apply if the Required Actions and associated Completion Times cannot be met. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours. The Completion Time of 12 hours is reasonable, based on operating experience, for reaching MODE 3 from RTP in an orderly manner and without challenging unit systems. In MODE 3, APSR alignment limits are not required because the reactor is not generating significant THERMAL POWER and excessive local LHRs cannot occur from APSR misalignment.

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1

Verification at a 12 hour Frequency that individual APSR positions are within 6.5% of the group average height limits allows the operator to detect an APSR beginning to deviate from its expected position. In addition, APSR position is continuously available to the operator in the control room so that during actual APSR motion, deviations can immediately be detected.

Insert 3

Amendment Nos.

BASES (continued)

ACTIONS

A.1 (continued)

Completion Time for declaring the rod(s) inoperable is immediately. Therefore, LCO 3.1.4 or LCO 3.1.6 is entered immediately, and the required Completion Times for the appropriate Required Actions in those LCOs apply without delay.

SURVEILLANCE REQUIREMENTS

SR 3.1.7.1

A CHANNEL CHECK of the required position indication channel ensures that position indication for each CONTROL ROD and APSR remains OPERABLE and accurate. This CHANNEL CHECK will detect gross failures. ~~The required Frequency of 12 hours is adequate for verifying that no degradation in system OPERABILITY has occurred.~~

Insert 3

REFERENCES

1. UFSAR, Section 3.1.
2. UFSAR, Chapter 15.
3. 10 CFR 50.36.

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.8.2

The SDM is verified by performing a reactivity balance calculation, considering the following reactivity effects:

a. RCS boron concentration;

b. CONTROL ROD position;

c. RCS average temperature;

d. Fuel burnup;

e. Xenon concentration; and

f. Moderator temperature coefficient (MTC).

Insert 3

The Frequency of 24 hours is based on the generally slow change in required boron concentration and on the low probability of an accident occurring without the required SDM.

REFERENCES

1. 10 CFR 50, Appendix B, Section XI.
2. 10 CFR 50.59.
3. UFSAR, Section 4.3.4.
4. UFSAR, Sections 14.3, 14.4 and 14.6.
5. UFSAR, Section 14.4, Table 14-2.
6. 10 CFR 50.36.

BASES

ACTIONS (continued)

C.1

If the Required Action and associated Completion Time of Condition A or B are not met, then the reactor must be placed in MODE 3, a MODE in which this LCO does not apply. This Action ensures that the reactor does not continue operating in violation of the peaking limits, the ejected rod worth, the reactivity insertion rate assumed as initial conditions in the accident analyses, or the required minimum SDM assumed in the accident analyses. The required Completion Time of 12 hours is reasonable, based on operating experience regarding the amount of time required to reach MODE 3 from RTP without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.1.1

This Surveillance ensures that the sequence and overlap limits are not violated. ~~A Surveillance Frequency of 12 hours is acceptable because little rod motion due to fuel burnup occurs in 12 hours. Also, the Frequency takes into account other information available in the control room for monitoring the status of the regulating rods.~~

Insert 3

SR 3.2.1.2

Verification of the regulating rod position limits as specified in the COLR ~~at a Frequency of 12 hours~~ is sufficient to detect whether the regulating rod groups may be approaching or exceeding their group position limits~~, because little rod motion occurs due to fuel burnup occurs in 12 hours. Also, the Frequency takes into account other information available in the control room for monitoring the status of the regulating rods.~~

Insert 3

SR 3.2.1.3

Prior to achieving criticality, an estimated critical position for the CONTROL RODS is determined. Verification that SDM meets the minimum requirements ensures that sufficient SDM capability exists with the CONTROL RODS at the estimated critical position if it is necessary to shut down or trip the reactor after criticality. The Frequency of 4 hours prior to criticality provides sufficient time to verify SDM capability and establish the estimated critical position.

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1

Insert 3

~~Verification of the AXIAL POWER IMBALANCE indication every 12 hours ensures that the AXIAL POWER IMBALANCE limits are not violated and takes into account other information and alarms available to the operator in the control room. This Surveillance Frequency is acceptable because the mechanisms that can cause AXIAL POWER IMBALANCE, such as xenon redistribution or CONTROL ROD drive mechanism malfunctions that cause slow AXIAL POWER IMBALANCE increases, can be discovered by the operator before the specified limits are violated.~~

REFERENCES

1. 10 CFR 50.46.
2. 10 CFR 50.36.
3. SLC 16.7.8, Incore Instrumentation

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS (continued)

Backup Detector System consist of OPERABLE (Reference 4) Incore detectors configured as follows:

a. Two sets of four detectors shall lie in each core half. Each set of detectors shall lie in the same axial plane. The two sets in the same core half may lie in the same axial plane.

b. Detectors in the same plane shall have quarter core radial symmetry.Figure B 3.2.3-1 (Backup Incore Detector System for QPT Measurement) depicts an example of this configuration.

The Excore Detector System consists of four detectors (one located outside each quadrant of the core). Each detector consists functionally of two six-foot uncompensated ion chambers adjacent to the top and bottom halves of the core.

SR 3.2.3.1

Insert 3

~~Checking the QPT indication every 7 days ensures that the operator can determine whether the plant computer software and Incore Detector System inputs for monitoring QPT are functioning properly, and takes into account other information and alarms available to the operator in the Control Room. This procedure allows the QPT mechanisms, such as xenon redistribution, burnup gradients, and CONTROL ROD drive mechanism malfunctions, which can cause slow development of a QPT, to be detected. Operating experience has confirmed the acceptability of a Surveillance Frequency of 7 days.~~

Following restoration of the QPT to within the steady state limit, operation at ≥ 95% RTP may proceed provided the QPT is determined to remain within the steady state limit at the increased THERMAL POWER level. In case QPT exceeds the steady state limit for more than 24 hours or exceeds the transient limit (Condition A, B, or D), the potential for xenon redistribution is greater. Therefore, the QPT is monitored for 12 consecutive hourly intervals to determine whether the period of any oscillation due to xenon redistribution causes the QPT to exceed the steady state limit again.

REFERENCES

1. 10 CFR 50.46.
2. BAW 10122A, "Normal Operating Controls," Rev. 1, May 1984.
3. 10 CFR 50.36.
4. SLC 16.7.8, Incore Instrumentation

Amendment Nos

BASES

ACTIONS

D.1 (continued)

required to be OPERABLE. To achieve this status, all CRD trip breakers must be opened. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to open CRD trip breakers without challenging unit systems.

E.1

If the Required Action and associated Completion Time of Condition A are not met and Table 3.3.1-1 directs entry into Condition E, the unit must be brought to a MODE in which the specified RPS trip Function is not required to be OPERABLE. To achieve this status, THERMAL POWER must be reduced < 30% RTP. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach 30% RTP from full power conditions in an orderly manner without challenging unit systems.

F.1

If the Required Action and associated Completion Time of Condition A are not met and Table 3.3.1-1 directs entry into Condition F, the unit must be brought to a MODE in which the specified RPS trip Function is not required to be OPERABLE. To achieve this status, THERMAL POWER must be reduced < 2% RTP. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach 2% RTP from full power conditions in an orderly manner without challenging unit systems.

SURVEILLANCE REQUIREMENTS

The SRs for each RPS Function are identified by the SRs column of Table 3.3.1-1 for that Function. Most Functions are subject to CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION testing.

The SRs are modified by a Note. The Note directs the reader to Table 3.3.1-1 to determine the correct SRs to perform for each RPS Function.

SR 3.3.1.1

Performance of the CHANNEL CHECK ~~once every 12 hours~~ ensures that a gross failure of instrumentation has not occurred. *For Unit(s) with the digital RPS complete, the CHANNEL CHECK requirement is met automatically. The digital RPS provides continuous online automatic monitoring of each of the input signals in each channel, performs*

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1 (continued)

signal online validation against required acceptance criteria, and provides hardware functional validation. If any protective channel input signal is identified to be in the failure status, this condition is alarmed on the Unit Statalarm and input to the plant OAC. Immediate notification of the failure status is provided to the Operations staff.

A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. **For Unit(s) with the RPS digital upgrade not complete, if the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Off scale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.**

Insert 3

The Frequency of performing a manual CHANNEL CHECK, equivalent to once every shift, is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal but more frequent checks of channel OPERABILITY during normal operational use of the displays associated with the LCO's required channels.

For Functions that trip on a combination of several measurements, such as the Nuclear Overpower Flux/Flow Imbalance Function, the CHANNEL CHECK must be performed on each input.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.2

This SR is the performance of a heat balance calibration for the power range channels ~~every 24 hours~~ when reactor power is > 15% RTP. The heat balance calibration consists of a comparison of the results of the calorimetric with the power range channel output. The outputs of the power range channels are normalized to the calorimetric. If the calorimetric exceeds the Nuclear Instrumentation System (NIS) channel output by ≥ 2% RTP, the NIS is not declared inoperable but must be adjusted. If the NIS channel cannot be properly adjusted, the channel is declared inoperable. A Note clarifies that this Surveillance is required to be performed only if reactor power is ≥ 15% RTP and that 24 hours is allowed for performing the first Surveillance after reaching 15% RTP. At lower power levels, calorimetric data are less accurate.

The power range channel's output shall be adjusted consistent with the calorimetric results if the calorimetric exceeds the power range channel's output by ≥ 2% RTP. The value of 2% is adequate because this value is assumed in the safety analyses of UFSAR, Chapter 15 (Ref. 2). These checks and, if necessary, the adjustment of the power range channels ensure that channel accuracy is maintained within the analyzed error margins. ~~The 24 hour Frequency is adequate, based on unit operating experience, which demonstrates the change in the difference between the power range indication and the calorimetric results rarely exceeds a small fraction of 2% in any 24 hour period. Furthermore, the control room operators monitor redundant indications and alarms to detect deviations in channel outputs.~~

Insert 3

SR 3.3.1.3

A comparison of power range nuclear instrumentation channels against incore detectors shall be performed ~~at a 31 day Frequency~~ when reactor power is ≥ 15% RTP. A Note clarifies that 24 hours is allowed for performing the first Surveillance after reaching 15% RTP. If the absolute value of imbalance error is ≥ 2% RTP, the power range channel is not inoperable, but an adjustment of the measured imbalance to agree with the incore measurements is necessary. The Imbalance error calculation is adjusted for conservatism by applying a correlation slope (CS) value to the error calculation formula. This ensures that the value of the API_o is > API_I. The CS value is listed in the COLR and is cycle dependent. If the power range channel cannot be properly recalibrated, the channel is declared inoperable. The calculation of the Allowable Value envelope assumes a difference in out of core to incore measurements of 2.0%. Additional inaccuracies beyond those that are measured are also included in the setpoint envelope calculation. ~~The 31 day Frequency is adequate,~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.3 (continued)

Insert 3

considering that long term drift of the excore linear amplifiers is small and burnup of the detectors is slow. Also, the excore readings are a strong function of the power produced in the peripheral fuel bundles, and do not represent an integrated reading across the core. The slow changes in neutron flux during the fuel cycle can also be detected at this interval.

SR 3.3.1.4

The SR is modified by a Note indicating that it is not applicable to Unit(s) with the RPS digital upgrade complete.

A CHANNEL FUNCTIONAL TEST is performed on each required RPS channel to ensure that the entire channel will perform the intended function. Setpoints must be found within the Allowable Values specified in Table 3.3.1-1. Any setpoint adjustment shall be consistent with the assumptions of the current uncertainty analysis.

The as found and as left values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis. The requirements for this review are outlined in BAW-10167 (Ref. 6).

The Frequency of 45 days on a STAGGERED TEST BASIS is consistent with the calculations of Reference 6 that indicate the RPS retains a high level of reliability for this test interval.

SR 3.3.1.5

The SR is modified by a Note indicating that it is only applicable to Unit(s) with the RPS digital upgrade complete. This SR manually verifies that the software setpoints are correct. The proper functioning of the processor portion of the channel is continuously checked by an automatic cyclic self monitoring.

The Frequency of 92 days is considered adequate since software is not subject to drift and the SR is only verifying that the setpoint was not incorrectly set.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.6

The SR is modified by a Note indicating that it is only applicable to Unit(s) with the RPS digital upgrade complete. This SR requires manual actuation of the output channel interposing relays to demonstrate OPERABILITY of the relays. The proper functioning of the processor portion of the channel is continuously checked by an automatic cyclic self monitoring.

Insert 3

The Frequency of 92 days is considered adequate based on operating experience that demonstrates the rarity of more than one channel's relay failing within the same interval.

SR 3.3.1.7

A Note to the Surveillance indicates that neutron detectors are excluded from CHANNEL CALIBRATION. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure virtually instantaneous response.

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and **bistable** *(or processor output trip device for Unit(s) with the RPS digital upgrade complete)* setpoint errors are within the assumptions of the uncertainty analysis. Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the resistance temperature detectors (RTD) sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

The 18 month frequency for the CHANNEL FUNCTIONAL TEST is based on design capabilities and reliability of the digital RPS. Since the CHANNEL FUNCTIONAL TEST is a part of the CHANNEL CALIBRATION a separate SR is not retained. The digital RPS software performs a continuous online automated cross channel check, separately for each channel, and continuous online signal error detection and validation. The protection system also performs continuous online hardware monitoring. The CHANNEL FUNCTIONAL TEST essentially validates the self monitoring function and checks for a small set of failure modes that are undetectable by the self monitoring function.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.7 (continued)

For Unit(s) with the RPS digital upgrade complete, the digital processors shall be rebooted as part of the calibration. This verifies that the software and setpoints have not changed.

Insert 3

~~The Frequency is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the uncertainty analysis.~~ ~~*For Unit(s) with the digital upgrade complete, the 18 month calibration interval is also justified by the reliability of components whose failure modes are not automatically detected or indicated.*~~

REFERENCES

1. UFSAR, Chapter 7.
2. UFSAR, Chapter 15.
3. 10 CFR 50.49.
4. EDM-102, "Instrument Setpoint/Uncertainty Calculations."
5. NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1979.
6. BAW-10167, May 1986.
7. 10 CFR 50.36.

BASES

ACTIONS (continued)

B.1, B.2.1, and B.2.2

Condition B applies if two or more RTCs are inoperable or if the Required Action and associated Completion Time of Condition A are not met in MODE 1, 2, or 3. In this case, the unit must be placed in a MODE in which the LCO does not apply. This is done by placing the unit in at least MODE 3 with all CRD trip breakers open or with power from all CRD trip breakers removed within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems.

C.1 and C.2

Condition C applies if two or more RTCs are inoperable or if the Required Action and associated Completion Time of Condition A are not met in MODE 4 or 5. In this case, the unit must be placed in a MODE in which the LCO does not apply. This is done by opening all CRD trip breakers or removing power from all CRD trip breakers. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to open all CRD trip breakers or remove power from all CRD trip breakers without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.3.1

The SRs include performance of a CHANNEL FUNCTIONAL TEST ~~every 31 days~~. This test shall verify the OPERABILITY of the RTC and its ability to receive and properly respond to channel trip and reactor trip signals.

Insert 3

~~The Frequency of 31 days is based on operating experience, which has demonstrated that failure of more than one channel of a given function in any 31 day interval is a rare event.~~

This testing is normally performed on a rotational basis ~~with one RTC being tested each week~~. Testing ~~one RTC each week~~ in this manner reduces the likelihood of the same systematic test errors being introduced into each redundant RTC.

BASES

ACTIONS (continued)

C.1, C.2.1, and C.2.2

With the Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to MODE 3, with all CRD trip breakers open or with power from all CRD trip breakers removed within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems.

D.1 and D.2

With the Required Action and associated Completion Time of Condition A or B not met in MODE 4 or 5, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, all CRD trip breakers must be opened or power from all CRD trip breakers removed within 6 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to open all CRD trip breakers or remove power from all CRD trip breakers without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1

SR 3.3.4.1 is to perform a CHANNEL FUNCTIONAL TEST every 31 days. This test verifies the OPERABILITY of the trip devices by actuation of the end devices. Also, this test independently verifies the undervoltage and shunt trip mechanisms of the trip breakers. The Frequency of 31 days is based on operating experience, which has demonstrated that failure of more than one channel of a given function in any 31 day interval is a rare event.

Insert 3

REFERENCES

1. UFSAR, Chapter 7.

2. 10 CFR 50.36.

Amendment Nos

BASES (continued)

SURVEILLANCE REQUIREMENTS

The ESPS Parameters listed in Table 3.3.5–1 are subject to CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION. The operational bypasses associated with each RCS Pressure ESPS instrumentation channel are also subject to these SRs to ensure OPERABILITY of the ESPS instrumentation channel.

SR 3.3.5.1

Performance of the CHANNEL CHECK ~~every 12 hours~~ ensures that a gross failure of instrumentation has not occurred. *For Unit(s) with the digital ESPS complete, the CHANNEL CHECK requirement is met automatically. The digital ESPS provides continuous online automatic monitoring of each of the input signals in each channel, performs signal online validation against required acceptance criteria, and provides hardware functional validation. If any protective channel input signal is identified to be in the failure status, this condition is alarmed on the Unit Statalarm and input to the plant OAC. Immediate notification of the failure status is provided to the Operations staff.*

A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that input instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two input instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined, based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1 (continued)

Insert 3

~~The Frequency for a manual CHANNEL CHECK, equivalent to every shift, is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels.~~ The CHANNEL CHECK supplements less formal, but potentially more frequent, checks of channel operability during normal operational use of the displays associated with the LCO's required channels.

SR 3.3.5.2

The SR is modified by a Note indicating that it is only applicable to Unit(s) with the ESPS digital upgrade complete. This SR manually verifies that the software setpoints are correct. The proper functioning of the processor portion of the channel is continuously checked by automatic cyclic self monitoring.

~~*The Frequency of 92 days is considered adequate since software is not subject to drift and the SR is only verifying that the setpoint was not incorrectly set.*~~

SR 3.3.5.3

The SR is modified by a Note indicating that it is not applicable to Unit(s) with the ESPS digital upgrade complete.

A CHANNEL FUNCTIONAL TEST is performed on each required ESPS input channel to ensure the entire channel, including the bypass function, will perform the intended functions. Any setpoint adjustment shall be consistent with the assumptions of the current unit specific uncertainty analysis.

~~**The Frequency of 92 days is based on operating experience, with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel of a given function in any 92 day interval is a rare event.**~~

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.4

CHANNEL CALIBRATION is a complete check of the input instrument channel, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION assures that measurement errors and **bistable** *(or processor output trip device for Unit(s) with the ESPS digital upgrade complete)* setpoint errors are within the assumptions of the unit specific uncertainty analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the uncertainty analysis.

The 18 month frequency for the CHANNEL FUNCTIONAL TEST is based on design capabilities and reliability of the digital RPS. Since the CHANNEL FUNCTIONAL TEST is a part of the CHANNEL CALIBRATION a separate SR is not retained. The digital RPS software performs a continuous online automated cross channel check, separately for each channel, and continuous online signal error detection and validation. The protection system also performs continuous online hardware monitoring. The CHANNEL FUNCTIONAL TEST essentially validates the self monitoring function and checks for a small set of failure modes that are undetectable by the self monitoring function.

For Unit(s) with the ESPS digital upgrade complete, the digital processors shall be rebooted as part of the calibration. This verifies that the software and setpoints have not changed.

Insert 3

This Frequency is justified by the assumption of an 18 month calibration interval to determine the magnitude of equipment drift in the uncertainty analysis. *For Unit(s) with the digital upgrade complete, the 18 month calibration interval is justified by the reliability of components whose failure modes are not automatically detected or indicated.*

REFERENCES

1. UFSAR, Chapter 7.
2. 10 CFR 50.49.
3. EDM-102, "Instrument Setpoint/Uncertainty Calculations."
4. UFSAR, Chapter 15.
5. 10 CFR 50.36.

Amendment Nos.

BASES

ACTIONS

B.1 and B.2 (continued)

With the Required Action and associated Completion Time not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required MODES from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST of the ESPS manual initiation. This test verifies that the initiating circuitry is OPERABLE and will actuate the automatic actuation output logic channels. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. This Frequency is demonstrated to be sufficient, based on operating experience, which shows these components usually pass the Surveillance when performed on the 18 month Frequency.~~

Insert 3

REFERENCES

1. 10 CFR 50.36.

Amendment No.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.7.1

The SR is modified by a Note indicating that it is only applicable to Unit(s) with the ESPS digital upgrade complete. This SR requires manual actuation of the output channel interposing relays to demonstrate OPERABILITY of the relays. The proper functioning of the processor portion of the channel is continuously checked by automatic cyclic self monitoring.

Insert 3

~~*The Frequency of 92 days is considered adequate based on operating experience that demonstrates the rarity of more than one channel's relay failing within the same interval.*~~

SR 3.3.7.2

~~**SR 3.3.7.2 is the performance of a CHANNEL FUNCTIONAL TEST on a 92 day Frequency for Unit(s) with the ESPS digital upgrade not complete** *and an 18 month Frequency for Unit(s) with the ESPS digital upgrade complete.*~~ *For Unit(s) with the ESPS digital upgrade complete, the digital processors shall be rebooted as part of the functional test. This verifies that the software and setpoints have not changed.*

~~**For Unit(s) with the ESPS digital upgrade not complete, the 92 day Frequency is based on operating experience that demonstrates the rarity of more than one channel failing within the same interval.**~~

~~*For Unit(s) with the ESPS digital upgrade complete, the 18 month Frequency is based on the design capabilities and reliability of the new digital ESPS.*~~ *The digital ESPS software performs a continuous online automated cross channel check, separately for each channel, and continuous online signal error detection and validation. The protection system also performs continual online hardware monitoring. The CHANNEL FUNCTIONAL TEST essentially validates the self monitoring function and checks for a small set of failure modes that are undetectable by the self monitoring function.* ~~*The reliability of components whose failure modes are not automatically detected or indicated also support a test frequency of 18 months.*~~

REFERENCES

1. 10 CFR 50.46.

2. UFSAR, Chapter 15.

3. 10 CFR 50.36.

BASES (continued)

SURVEILLANCE REQUIREMENTS

As noted at the beginning of the SRs, the SRs apply to each PAM instrumentation Function in Table 3.3.8-1 except where indicated.

SR 3.3.8.1

Performance of the CHANNEL CHECK ~~once every 31 days~~ for each required instrumentation channel that is normally energized ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel with a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION. The high radiation instrumentation should be compared with similar unit instruments located throughout the unit. If the radiation monitor uses keep alive sources or check sources OPERABLE from the control room, the CHANNEL CHECK should also note the detector's response to these sources.

Agreement criteria are based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Offscale low current loop channels are, where practical, verified to be reading at the bottom of the range and not failed downscale.

Insert 3

~~The Frequency is based on operating experience that demonstrates channel failure is rare.~~ The CHANNEL CHECK supplements less formal but more frequent checks of channels during normal operational use of the displays associated with this LCO's required channels.

SR 3.3.8.2 and SR 3.3.8.3

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. This test verifies the channel responds to measured parameters within the necessary range and accuracy.

Amendment Nos

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.8.2 and SR 3.3.8.3 (continued)

Note 1 to SR 3.3.8.3 clarifies that the neutron detectors are not required to be tested as part of the CHANNEL CALIBRATION. There is no adjustment that can be made to the detectors. Furthermore, adjustment of the detectors is unnecessary because they are passive devices, with minimal drift. Slow changes in detector sensitivity are compensated for by performing the daily calorimetric calibration and the monthly axial channel calibration.

For the Containment Area Radiation instrumentation, a CHANNEL CALIBRATION may consist of an electronic calibration of the channel, not including the detector, for range decades above 10 R/hr, and a one point calibration check of the detector below 10 R/hr with a gamma source.

Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the resistance temperature detectors (RTD)sensors or Core Exit thermocouple sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

SR 3.3.8.2 is modified by a Note indicating that it is applicable only to Functions 7 and 22. SR 3.3.8.3 is modified by Note 2 indicating that it is not applicable to Functions 7 and 22. ~~The Frequency of each SR is based on operating experience and is justified by the assumption of the specified calibration interval in the determination of the magnitude of equipment drift.~~

Insert 3

REFERENCES

1. Duke Power Company letter from Hal B. Tucker to Harold M. Denton (NRC) dated September 28, 1984.

2. UFSAR, Section 7.5.

3. NRC Letter from Helen N. Pastis to H. B. Tucker, "Emergency Response Capability - Conformance to Regulatory Guide 1.97," dated March 15, 1988.

4. Regulatory Guide 1.97, "Instrumentation for Light Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," Revision 3, May 1983.

Amendment Nos

BASES

ACTIONS

B.1, B.2, B.3, and B.4 (continued)

Action B.1, Required Action B.2, and Required Action B.3 preclude rapid positive reactivity additions. The 1 hour Completion Time for Required Action B.3 and Required Action B.4 provides sufficient time for operators to accomplish the actions. The 12 hour Frequency for performing the SDM verification provides reasonable assurance that the reactivity changes possible with CONTROL RODS inserted are detected before SDM limits are challenged.

C.1

With reactor power > 4E-4% RTP in MODE 2, 3, 4, or 5 on the wide range neutron flux instrumentation, continued operation is allowed with one or more required source range neutron flux channels inoperable. The ability to continue operation is justified because the instrumentation does not provide a safety function during high power operation. However, actions are initiated within 1 hour to restore the channel(s) to OPERABLE status for future availability. The Completion Time of 1 hour is sufficient to initiate the action. The action must continue until channels are restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined, based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1 (continued)

the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction.

Insert 3

The Frequency, equivalent to every shift, is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but potentially more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO's required channels. When operating in Required Action A.1, CHANNEL CHECK is still required. However, in this condition, a redundant source range may not be available for comparison. CHANNEL CHECK may still be performed via comparison with wide range detectors, if available, and verification that the OPERABLE source range channel is energized and indicating a value consistent with current unit status.

SR 3.3.9.2

For source range neutron flux channels, CHANNEL CALIBRATION is a complete check and readjustment of the channels from the preamplifier input to the indicators. This test verifies the channel responds to measured parameters within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests.

The SR is modified by a Note excluding neutron detectors from CHANNEL CALIBRATION. It is not necessary to test the detectors because generating a meaningful test signal is difficult. The detectors are of simple construction, and any failures in the detectors will be apparent as change in channel output.

The Frequency of 18 months is based on demonstrated instrument CHANNEL CALIBRATION reliability over an 18 month interval, such that the instrument is not adversely affected by drift.

REFERENCES

1. 10 CFR 50.36.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.10.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE.

Insert 3

The Frequency, equivalent to every shift, is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but potentially more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO's required channels.

When operating in Required Action A.1, CHANNEL CHECK is still required. However, in this condition, a redundant wide range may not be available for comparison. CHANNEL CHECK may still be performed via comparison with power or source range detectors, if available, and verification that the OPERABLE wide range channel is energized and indicates a value consistent with current unit status.

SR 3.3.10.2

For wide range neutron flux channels, CHANNEL CALIBRATION is a complete check and readjustment of the channels, from the preamplifier input to the indicators. This test verifies the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.10.2 (continued)

The SR is modified by a Note excluding neutron detectors from CHANNEL CALIBRATION. It is not necessary to test the detectors because generating a meaningful test signal is difficult. In addition, the detectors are of simple construction, and any failures in the detectors will be apparent as a change in channel output. The Frequency is based on operating experience and consistency with the typical industry refueling cycle and is justified by demonstrated instrument reliability over an 18 month interval such that the instrument is not adversely affected by drift.

Insert 3

SR 3.3.10.3

SR 3.3.10.3 is the verification once each reactor startup of one decade of overlap with the source range neutron flux instrumentation. The wide range detector should be on scale and indicating $\geq$ 1E-8% of RTP when the source range detector is indicating $\leq 10^4$ counts per second in order for the wide range detector to indicate a one decade change prior to the source range detector going off scale. This ensures a continuous source of power indication during the approach to criticality.

The test may be omitted if performed within the previous 7 days based on operating experience, which shows that source range and wide range instrument overlap does not change appreciably within this test interval.

REFERENCES

1. 10 CFR 50.36.

BASES

ACTIONS (continued)

B.1

With two channels inoperable or if the Required Action and associated Completion Time of Condition A can not be met, the channel(s) must be returned to service within 72 hours. An inoperable channel includes any channel bypassed by Condition A.

C.1 and C.2

With the Required Action and associated Completion Time of Condition B not met, the unit must be placed in MODE 3 within 12 hours and main steam header pressure must be reduced to less than 700 psig within 18 hours. The allowed Completion Time is reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.11.1

Performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION.

Agreement criteria are based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Off scale low current loop channels are verified, where practical, to be reading at the bottom of the range and not failed downscale.

A continuous, automatic CHANNEL CHECK function is provided by Software. If a channel is outside the criteria, then an alarm is provided to the control room. Manual performance of the CHANNEL CHECK is acceptable.

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.11.1 (continued)

Insert 3

The frequency, about once every shift, is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour period is extremely low, the CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but potentially more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.

SR 3.3.11.2

A CHANNEL FUNCTIONAL TEST is performed by comparing the test input signal to the value transmitted to the Calibration and Test Computer. This enables verification of the voltage references and the signal commons. This will ensure the channel will perform its intended function.

The Frequency of 31 days is based on operating experience, with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel in any 31 day interval is a rare event.

SR 3.3.11.3

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The test verifies the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channels adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and setpoint errors are within the assumptions of the setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint analysis.

The Frequency is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

REFERENCES

1. 10 CFR 50.36.

Amendment Nos.

BASES (continued)

ACTIONS

A Note has been added to the ACTIONS indicating that a separate Condition entry is allowed for manual initiation switches associated with each SG.

A.1

With one manual initiation switch per steam generator inoperable, the manual initiation switch must be restored to OPERABLE status within 72 hours. The Completion Time of 72 hours is based on unit operating experience and administrative controls, which provide alternative means of AFIS initiation via individual component controls. The 72 hour Completion Time is consistent with the allowed outage time for the components actuated by the AFIS.

B.1

With both manual initiation switches per steam generator inoperable or the Required Action and associated Completion Time of Condition A not met, the Unit must be placed in MODE 3 within 12 hours and the main steam header pressure reduced to less than 700 psig within 18 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required MODES from full power conditions in an orderly manner and without challenging Unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.12.1

This SR requires the performance of a digital CHANNEL FUNCTIONAL TEST to ensure that the channels can perform their intended functions.

Insert 3

~~The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function, while the risks of testing during unit operation is avoided.~~

REFERENCES

1. IEEE-279-1971, April 1972.
2. 10 CFR 50.36.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.13.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST to ensure that the digital channels can perform their intended functions. ~~The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function, while the risks of testing during Unit operation is avoided.~~

Insert 3

REFERENCES

1. 10 CFR 50.36.

Amendment Nos.

BASES

ACTIONS (continued)

A.1

With one or more required EFW pump initiation circuits with one LOMF channel inoperable, the channel(s) must be placed in trip within 1 hour. With the channel in trip, the resultant logic is one-out-of-one. This channel may be considered placed in trip, after tripping, by installing jumpers or by other means that assure the channel remains in the tripped condition.

B.1

With one or more EFW pump initiation circuits inoperable or the Required Action and associated Completion Time of Condition A not met, the affected EFW pump(s) must be declared inoperable immediately since the initiation function is no longer capable of performing its safety function.

SURVEILLANCE REQUIREMENTS

SR 3.3.14.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST to ensure the LOMF pump instrumentation channels can perform their intended function.

Insert 3

The Frequency of 31 days is based on operating experience with regard to channel OPERABILITY, which demonstrates that failure of more than one channel of a given function in any 31 day interval is a rare event.

SR 3.3.14.2

This SR requires the performance of a CHANNEL FUNCTIONAL TEST of the manual initiation circuit. This test verifies that the initiating circuitry is OPERABLE and will actuate the emergency feedwater pumps by either starting a motor driven emergency feedwater pump or opening the steam isolation valve that isolates the supply of steam to the drive for the turbine driven emergency feedwater pump.

SR 3.3.14.3

This SR requires the performance of a CHANNEL FUNCTIONAL TEST of the automatic initiation circuit. This test verifies that the two-out-of-two logic circuit is functional. This test simulates the required inputs to the logic

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.14.3 (continued)

circuit and verifies successful operation of the automatic initiation circuit. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function, while the risks of testing during operation are avoided.

Insert 3

SR 3.3.14.4

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The test verifies the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channels adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and setpoint errors are within the assumptions of the setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint analysis.

The Frequency is based on the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

REFERENCES

1. UFSAR, Chapters 7 and 15.
2. 10 CFR 50.36.

BASES (continued)

APPLICABILITY

Both TSV Closure channels must be OPERABLE in MODES 1, 2 and 3 with any TSVs open. In these conditions when there is significant mass and energy in the RCS and steam generators, the TSV Closure function must be OPERABLE or the TSVs closed. When the TSVs are closed, they are already performing the safety function.

In MODE 4, the steam generator energy is low. Therefore, the TSV Closure channels are not required to be OPERABLE. In MODES 5 and 6, the steam generators do not contain a significant amount of energy because their temperature is below the boiling point of water; therefore, the TSV Closure channels are not required for isolation of potential high energy secondary system pipe breaks in these MODES

ACTIONS

A.1

With one or more TSV Closure channels inoperable, all TSVs must be declared inoperable. A Completion Time of 1 hour is provided to return the TSV Closure channels to OPERABLE status. The 1 hour Completion Time is sufficient time to correct minor problems.

SURVEILLANCE REQUIREMENTS

SR 3.3.15.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST to ensure that the channels can perform their intended function. This test verifies the TSV Closure automatic actuation channels are functional. This test simulates the required inputs to the logic circuit and verifies successful operation of the automatic actuation logic channels. The test need not include actuation of the end device. This is due to the risk of a unit transient caused by the closure of TSVs during testing at power. The Frequency of 31 days is based on engineering judgment and operating experience, which determined the interval provided adequate confidence that the TSV Closure channels are available to perform their safety function, while the risks of testing at operation are avoided.

Insert 3

REFERENCES

1. UFSAR, Section 15.13.
2. 10 CFR 50.36.
3. 10 CFR 100.

Amendment Nos.

BASES (continued)

LCO

One channel of RB Purge Isolation-High Radiation instrumentation is required to be OPERABLE. OPERABILITY of the instrumentation includes proper operation of the sample pump. This LCO addresses only the gas sampler portion of the System.

APPLICABILITY

The RB purge isolation–high radiation instrumentation shall be OPERABLE whenever movement of recently irradiated fuel assemblies within the RB is taking place. These conditions are those under which the potential for fuel damage, and thus radiation release, is the greatest. While in MODES 1, 2, 3, and 4, the Purge Valve Isolation System does not need to be OPERABLE because the purge valves are required to be sealed closed. While in MODES 5 and 6, without fuel handling involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 72 hours) in progress, the Purge Valve Isolation System does not need to be OPERABLE because the potential for a radioactive release is minimized. The need to use the purge valves in MODES 5 and 6 is in preparation for entry. This capability is required to minimize doses for personnel entering the building and is independent of the automatic isolation capability.

ACTIONS

A.1, A.2.1, and A.2.2

Condition A applies to failure of the high radiation purge function during movement of recently irradiated fuel assemblies within the RB.

With one channel inoperable during movement of recently irradiated fuel assemblies within the RB, the RB purge valves must be closed, or movement of recently irradiated fuel assemblies within the RB must be suspended. Required Action A.1 accomplishes the function of the high radiation channel. Required Action A.2.1 and Required Action A.2.2 place the unit in a configuration in which purge isolation on high radiation is not required. The Completion Time of "Immediately" is consistent with the urgency associated with the loss of RB isolation capability under conditions in which the fuel handling accidents involving handling recently irradiated fuel are possible and the high radiation function provides the only automatic actions to mitigate radiation release.

SURVEILLANCE REQUIREMENTS

SR 3.3.16.1

SR 3.3.16.1 is the performance of the CHANNEL CHECK for the RB purge isolation–high radiation instrumentation once every 12 hours to ensure that a gross failure of instrumentation has not occurred. The CHANNEL CHECK is normally a comparison of the parameter indicated on the

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.16.1 (continued)

radiation monitoring instrumentation channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. Performance of the CHANNEL CHECK helps to ensure that the instrumentation continues to operate properly between each CHANNEL CALIBRATION. The high radiation instrumentation should be compared to similar unit instruments located throughout the unit. If the radiation monitor uses keep alive sources or check sources OPERABLE from the control room, the CHANNEL CHECK should also note the detector's response to these sources.

Agreement criteria are based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. The 12 hour Frequency, about once every shift, ~~is based~~ on operating experience that demonstrates channel failure is rare. Additionally, control room alarms and annunciators are provided to alert the operator to various "trouble" conditions associated with the instrument.

Insert 3

SR 3.3.16.2

This SR requires the performance of a CHANNEL FUNCTIONAL TEST to ensure that the channel can perform its intended function. The frequency requires the isolation capability of the reactor building purge valves to be verified functional once each refueling outage prior to movement of recently irradiated fuel assemblies within containment. This ensures that this function is verified prior to recently irradiated fuel assembly handling within containment. This test verifies the capability of the instrumentation to provide the RB isolation.

SR 3.3.16.3

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

The 18 month Frequency is based on engineering judgment and industry accepted practice.

BASES

ACTIONS

A.1 (continued)

capable of providing necessary transfer functions to ensure power is provided to the MFBs. The 24 hour Completion Time is considered appropriate based on engineering judgement, taking into consideration the time required to complete the required action.

Required Action A.1 is modified by a Note which indicates that the Completion Time is reduced when in Condition L of LCO 3.8.1. Condition L limits the Completion Time for restoring an inoperable channel to 4 hours when emergency power source(s) or offsite power source(s) are inoperable for extended time periods or for specific reasons.

B.1 and B.2

With the Required Action and associated Completion Time not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 in 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to allow for a controlled shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.3.17.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST of the EPSL automatic transfer function. The ES inputs to the Load Shed and Transfer to Standby function and the Retransfer to Startup function are verified to operate properly during an automatic transfer of the Main Feeder Buses to the Startup Transformer, Standby Buses, and retransfer to the Startup Transformers. ~~The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.~~

Insert 3

REFERENCES

1. UFSAR, Chapters 6 and 15.

2. 10 CFR 50.36.

Amendment Nos.

BASES (continued)

ACTIONS (continued)

D.1

With the Required Action and associated Completion Time not met during movement of irradiated fuel assemblies, movement of fuel assemblies must be suspended immediately. Suspension does not preclude completion of actions to establish a safe conservative condition. This action minimizes the probability or the occurrence of postulated events. The Completion Time of immediately is consistent with the required times for actions requiring prompt attention

SURVEILLANCE REQUIREMENTS

SR 3.3.18.1

A CHANNEL FUNCTIONAL TEST is performed on each voltage sensing circuit channel to ensure the channel will perform its function. A circuit is defined as three channels, one for each phase. Each channel consists of components from the sensing power transformer through the circuit auxiliary relays which operate contacts in the EPSL logic and breaker trip circuits. Minimum requirements consist of individual channel relay operation causing appropriate contact responses within associated loadshed/breaker circuits, alarm activations, and proper indications for the sensing circuit control power status. ~~The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.~~

Insert 3

REFERENCES

1. UFSAR, Chapters 6 and 15.

2. 10 CFR 50.36.

Amendment Nos.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.19.1

A CHANNEL FUNCTIONAL TEST is performed on each DGVP voltage sensing channel and DGVP actuation logic channel to ensure the entire channel will perform its intended function. Any setpoint adjustments shall be consistent with the assumptions of the setpoint analysis. The CHANNEL FUNCTIONAL TEST of the DGVP actuation logic channels includes verifying actuation of the switchyard isolation circuitry. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

SR 3.3.19.2

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and bistable setpoint errors are within the assumptions of the setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint analysis.

Insert 3

The Frequency is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

REFERENCES

1. UFSAR, Chapter 8.

2. 10 CFR 50.36.

Amendment Nos.

BASES

ACTIONS

B.1 (continued)

capable of providing the CT-5 DGVP function. The 72 hour completion time is based on engineering judgement taking into consideration the infrequency of actual grid system voltage degradation and the probability of an event requiring an ES actuation.

C.1 and C.2

If two or more voltage sensing relay channels or two actuation logic channels are inoperable, automatic protection from degraded grid voltage for the standby buses powered from the 100 kV transmission system is not available. Continued operation is allowed provided that the SL breakers are opened within one hour.

Additionally, with the Required Action and associated Completion Time of Condition A or B not met, the SL breakers must be opened within one hour. This arrangement provides a high degree of reliability for the emergency power system. The one hour Completion Time is based on engineering judgement taking into consideration the infrequency of actual grid system voltage degradation and the probability of an event requiring an ES actuation.

SURVEILLANCE REQUIREMENTS

SR 3.3.20.1

A CHANNEL FUNCTIONAL TEST is performed on each CT-5 DGVP voltage sensing channel and each CT-5 DGVP actuation logic channel to ensure the entire channel will perform its intended function. Any setpoint adjustments shall be consistent with the assumptions of the setpoint analysis.

Insert 3

The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

SR 3.3.20.2

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.20.2 (continued)

between successive tests. CHANNEL CALIBRATION shall find that measurement errors and bistable setpoint errors are within the assumptions of the setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint analysis.

Insert 3

The Frequency is justified by the assumption of an 18 month calibration interval in the determination of the magnitude of equipment drift in the setpoint analysis.

REFERENCES

1. UFSAR, Chapter 8.
2. 10 CFR 50.36.

BASES

ACTIONS

B.1 and B.2 (continued)

hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to allow for a controlled shutdown.

C.1

With both channels of the Keowee Emergency Start function inoperable then both Keowee Hydro Units must be declared inoperable immediately. The appropriate Required Actions will be implemented in accordance with LCO 3.8.1, "AC Sources–Operating."

SURVEILLANCE REQUIREMENTS

SR 3.3.21.1

A CHANNEL FUNCTIONAL TEST is performed on each Keowee Emergency Start channel to ensure the channel will perform its function during an automatic transfer of the Main Feeder Buses to the Startup Transfer, Standby Buses, and retransfer to the Startup Transformers. Insert 3 The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

REFERENCES

1. UFSAR, Chapters 6 and 15.
2. 10 CFR 50.36.

BASES (continued)

APPLICABILITY

The Manual Keowee Emergency Start function required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provides assurance that:

a. Systems needed to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

ACTIONS

A.1

If the required Manual Keowee Emergency Start channel is inoperable, both Keowee Hydro Units must be declared inoperable immediately. Therefore LCO 3.8.2 is entered immediately, and the required Completion Times for the appropriate Required Actions apply without delay.

SURVEILLANCE REQUIREMENTS

SR 3.3.22.1

Insert 3

A CHANNEL FUNCTIONAL TEST is performed on the required Manual Keowee Emergency Start channel to ensure the channel will perform its function. ~~The Frequency of 12 months is based on engineering judgment and operating experience that determined testing on a 12 month interval provides reasonable assurance that the circuitry is available to perform its safety function.~~

REFERENCES

1. 10 CFR 50.36.

BASES

ACTIONS (continued)

C.1 and C.2

With two or more voltage sensing channels or both actuation logic channels inoperable, automatic protection for LOOP events is no longer available. This places additional burden on the operators, even though they are still the credible resource for restoring power in a LOOP event. EPSL response from ES events are not affected. Therefore, allowable time for this condition is limited to 24 hours. The completion time is based on engineering judgement and the availability of adequate time for operator response to a LOOP.

The Condition is modified by a Note indicating that this condition may be entered independently for each set of channels associated with a main feeder bus. The Condition may also be entered independently for inoperable logic channels or inoperable voltage sensing channels. The Completion Time(s) are tracked separately from the time the Condition is entered for each.

D.1

With the Required Action and associated Completion Time not met, Required Action D.1 specifies initiation of action described in Specification 5.6.6 that requires a written report to be submitted to the NRC. This report discusses the results of the root cause evaluation of the inoperability and identifies proposed restorative actions. This action is appropriate since the MFBMP does not provide the only layer of protection in any DBE, but does provide defense-in-depth for any scenario which results in loss of power to the Main Feeder Busses. Operator actions are credited for SBO mitigation. The Completion Time of "Immediately" for Required Action D.1 ensures the requirements of Specification 5.6.6 are initiated.

SURVEILLANCE REQUIREMENTS

SR 3.3.23.1

A CHANNEL FUNCTIONAL TEST is performed on each MFBMP voltage sensing channel and MFBMP actuation logic channel to ensure the MFBMP will perform its intended function. The Frequency of 18 months is based on engineering judgment and operating experience that determined testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

Insert 3

BASES

ACTIONS (continued)

C.1 and C.2

If two or more required LPSW RB Waterhammer Prevention analog channel(s) or two digital logic channel(s) are inoperable or the Required Actions and associated Completion Times of Condition A or B are not met, the WPS must be configured in order to assure the Containment Integrity and Heat removal functions are maintained. To achieve this status, actions to prevent automatic closing by manually opening (remote or local) two LPSW RB Waterhammer Prevention Pneumatic Discharge Isolation valves in the same header shall be completed immediately and actions to repair the inoperable equipment shall be taken immediately. LCO 3.7.7 will also apply when the LPSW RB Waterhammer Prevention Pneumatic Discharge Isolation valves in the same header are opened.

SURVEILLANCE REQUIREMENTS

SR 3.3.27.1

Performance of the CHANNEL CHECK ~~every 12 hours~~ ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that analog instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two analog instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined, based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit.

Insert 3

~~The Frequency, equivalent to every shift, is based on operating experience that demonstrates channel failure is rare. Since the probability of two random failures in redundant channels in any 12 hour~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.27.1 (continued)

period ~~is extremely low~~, ~~the~~ CHANNEL CHECK minimizes the chance of loss of protective function due to failure of redundant channels. The CHANNEL CHECK supplements less formal, but potentially more frequent, checks of channel operability during normal operational use of the displays associated with the LCO's required channels.

SR 3.3.27.2

A CHANNEL FUNCTIONAL TEST is performed on each channel to ensure the circuitry will perform its intended function. ~~The Frequency of 92 days is based on engineering judgment and operating experience, with regard to channel OPERABILITY and drift, which demonstrates that failure of more than one channel in any 92 day interval is a rare event.~~

Insert 3

SR 3.3.27.3

A CHANNEL CALIBRATION is a complete check of the analog instrument channel, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. The CHANNEL CALIBRATION leaves the components adjusted to account for instrument drift to ensure that the circuitry remains operational between successive tests. ~~The 18-month Frequency is justified by the assumption of an 18-month calibration interval in the setpoint analysis determination of instrument drift during that interval.~~

REFERENCES 1. 10 CFR 50.36.

BASES

ACTIONS

B.1 and B.2 (continued)

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.28.1

A CHANNEL FUNCTIONAL TEST is performed on each LPSW Pump to ensure the auto-start circuit will perform its intended function. The Frequency of 18 months is based on engineering judgment and operating experience. Testing on an 18 month interval provides reasonable assurance that the circuitry is available to perform its safety function.

Insert 3

SR 3.3.28.2

A CHANNEL CALIBRATION is performed to verify that the components respond to the measured parameter within the necessary range and accuracy. The CHANNEL CALIBRATION leaves the components adjusted to account for instrument drift to ensure that the auto-start circuitry remains operational between successive tests. The Frequency is justified by the assumption of an 18 month calibration interval in the determination of the drift in the setpoint analysis.

REFERENCES

1. 10 CFR 50.36.

BASES (continued)

APPLICABILITY

In MODE 1 during steady state operation, the limits on RCS loop pressure, RCS loop average temperature, and RCS flow rate must be maintained with four pump or three pump operation in order to ensure that DNBR criteria will be met in the event of an unplanned loss of forced coolant flow or other DNB limited transient. In all other MODES the power level is low enough so that DNB is not a concern. Steady state operation, for the purposes of this specification, is defined as operation within a 4% (e.g., 88% - 92% RTP) power band for ≥ 4 hours.

ACTIONS

A.1

Loop pressure and loop average coolant temperature are controllable and measurable parameters. With one or both of these parameters not within the LCO limits, action must be taken to restore the parameters. RCS flow rate is not a controllable parameter and is not expected to vary during steady state four pump or three pump operation. However, if the flow rate is below the LCO limit, the parameter must be restored to within limits or power must be reduced as required in Required Action B.1, to restore DNBR margin and eliminate the potential for violation of the accident analysis bounds. The 2 hour Completion Time for restoration of the parameters provides sufficient time to adjust unit parameters, determine the cause for the off normal condition, and restore the readings within limits. The Completion Time is based on plant operating experience.

B.1

If the Required Action and associated Completion Time are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 2 within 12 hours. In MODE 2, the reduced power condition eliminates the potential for violation of the accident analysis bounds.

The 12 hour Completion Time is reasonable, based on operating experience, to reduce power in an orderly manner.

SURVEILLANCE REQUIREMENTS

SR 3.4.1.1

Since Required Action A.1 allows a Completion Time of 2 hours to restore parameters that are not within limits, the ~~12 hour~~ Surveillance Frequency for loop (hot leg) pressure is sufficient to ensure that the pressure can be

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.1.1 (continued)

Insert 3

restored to a normal operation, steady state condition following load changes and other expected transient operations. The RCS pressure value specified in the COLR is dependent on the number of pumps in operation and has been adjusted to account for the pressure loss difference between the core exit and the measurement location. The 12 hour interval has been shown by operating practice to be sufficient to regularly assess potential degradation and to verify operation is within safety analysis assumptions. A Note has been added to indicate the pressure limits for three pumps operating is applied to the loop with the highest pressure.

SR 3.4.1.2

Since Required Action A.1 allows a Completion Time of 2 hours to restore parameters that are not within limits, the 12 hour Surveillance Frequency for loop average temperature is sufficient to ensure that the RCS coolant temperature can be restored to a normal operation, steady state condition following load changes and other expected transient operations. The 12 hour interval has been shown by operating practice to be sufficient to regularly assess potential degradation and to verify that operation is within safety analysis assumptions. A Note has been added to indicate the temperature limits for three pumps operating are applied to the loop with the lowest loop average temperature for the condition in which there is a 0°F ΔTc setpoint.

SR 3.4.1.3

The 12 hour Surveillance Frequency for RCS total flow rate is performed using the installed flow instrumentation. The 12 hour interval has been shown by operating practice to be sufficient to regularly assess potential degradation and to verify that operation is within safety analysis assumptions.

SR 3.4.1.4

Measurement of RCS total flow rate by performance of a calorimetric heat balance once every 18 months allows the installed RCS flow instrumentation to be calibrated and verifies that the actual RCS flow is greater than or equal to the minimum required RCS flow rate specified in the COLR.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.1.4 (continued)

Insert 3

The Frequency of 18 months reflects the importance of verifying flow after a refueling outage when the core has been altered or RCS flow characteristics may have been modified, which may have caused change of flow. The Surveillance is modified by a Note that indicates the SR does not need to be performed until 7 days after stable thermal conditions are established at higher power levels. The Note is necessary to allow measurement of the flow rate at normal operating conditions at power in MODE 1. The Surveillance cannot be performed at low power or in MODE 2 or below because at low power the ΔT across the core may be too small to provide meaningful test results.

REFERENCES

1. UFSAR, Chapter 15.
2. 10 CFR 50.36

BASES

ACTIONS

B.1 and B.2 (continued)

Times are reasonable, based on operating experience, to reach the required MODE from full power conditions in an orderly manner and without challenging unit systems.

C.1 and C.2

Actions must be initiated immediately to correct operation outside of the P/T limits at times other than MODE 1, 2, 3, or 4, so that the RCPB is returned to a condition that has been verified acceptable by stress analysis.

The immediate Completion Time reflects the urgency of initiating action to restore the parameters to within the analyzed range. Most violations will not be severe, and the activity can be accomplished within this time in a controlled manner.

In addition to restoring operation to within limits, an evaluation is required to determine if RCS operation can continue. The evaluation must verify that the RCPB integrity remains acceptable and must be completed prior to entry into MODE 4. Several methods may be used, including comparison with pre-analyzed transients in the stress analysis, or inspection of the components.

ASME Code, Section XI, Appendix E (Ref. 6), may also be used to support the evaluation. However, its use is restricted to evaluation of the vessel beltline.

Condition C is modified by a Note requiring Required Action C.2 to be completed whenever the Condition is entered. The Note emphasizes the need to perform the evaluation of the effects of the excursion outside the allowable limits. Restoration alone, per Required Action C.1, is insufficient because higher than analyzed stresses may have occurred and may have affected RCPB integrity.

SURVEILLANCE REQUIREMENTS

SR 3.4.3.1

Verification that operation is within limits is required ~~every 30 minutes~~ when RCS pressure or temperature conditions are undergoing planned changes.

Insert 3

~~This Frequency is considered reasonable in view of the control room indication available to monitor RCS status. Thirty minutes permits assessment and correction for minor deviations within a reasonable time.~~

Surveillance for heatup, cooldown, or LH testing may be discontinued when the definition given in the relevant plant procedure for ending the activity is satisfied.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.3.1 (continued)

This SR is modified by a Note that requires this SR to be performed only during system heatup, cooldown, and LH testing.

REFERENCES

1. 10 CFR 50, Appendix G.
2. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.
3. Regulatory Guide 1.99, Revision 2, May 1988.
4. ASTM E 185-82, July 1982.
5. 10 CFR 50, Appendix H.
6. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.
7. 10 CFR 50.36.
8. FTI Doc. 32-5010572-00, Allowable LPI Pressures For LPI Cooler Swap.

BASES (continued)

APPLICABILITY

In MODES 1 and 2, the reactor is critical and has the potential to produce maximum THERMAL POWER. To ensure that the assumptions of the accident analyses remain valid, all RCS loops are required to be OPERABLE and in operation in these MODES to prevent DNB and core damage.

The decay heat production rate is much lower than the full power heat rate. As such, the forced circulation flow and heat sink requirements are reduced for lower, noncritical MODES as indicated by the LCOs for MODES 3, 4, and 5.

Operation in other MODES is covered by:

LCO 3.4.5, "RCS Loops – MODE 3";
LCO 3.4.6, "RCS Loops – MODE 4";
LCO 3.4.7, "RCS Loops – MODE 5, Loops Filled";
LCO 3.4.8, "RCS Loops – MODE 5, Loops Not Filled";
LCO 3.9.4, "Decay Heat Removal (DHR) and Coolant Circulation – High Water Level" (MODE 6); and
LCO 3.9.5, "Decay Heat Removal (DHR) and Coolant Circulation – Low Water Level" (MODE 6).

ACTIONS

A.1

If the requirements of the LCO are not met, the Required Action is to reduce power and bring the unit to MODE 3. This lowers power level and thus reduces the core heat removal needs and minimizes the possibility of violating DNB limits.

The Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging safety systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.4.1

This SR requires verification every 12 hours of the required number of loops in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal while maintaining the margin to DNB. The 12 hour interval has been shown by operating practice to be sufficient to regularly assess degradation and verify operation within safety analyses assumptions. In addition, control room indication and alarms will normally indicate loop status.

Insert 3

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.5.1

This SR requires verification ~~every 12 hours~~ that the required number of loops and pumps is in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. ~~The 12 hour interval has been shown by operating practice to be sufficient to regularly assess RCS loop status.~~ In addition, control room indication and alarms will normally indicate loop status.

Insert 3

SR 3.4.5.2

Verification that the required number of RCPs are OPERABLE ensures that an additional RCS loop can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power availability to the required pump that is not in operation. ~~The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience.~~

REFERENCES 1. 10 CFR 50.36.

Amendment Nos.

BASES

ACTIONS

B.1 and B.2 (continued)

RCS or DHR loop to OPERABLE status and operation must be initiated. Boron dilution requires forced circulation for proper mixing, and the margin to criticality must not be reduced in this type of operation. The immediate Completion Times reflect the importance of maintaining operation for decay heat removal. The action to restore must continue until one loop is restored to operation.

SURVEILLANCE REQUIREMENTS

SR 3.4.6.1

This Surveillance requires verification every 12 hours of the required DHR or RCS loop in operation to ensure forced flow is providing decay heat removal. Verification includes flow rate, temperature, or pump status monitoring. The 12 hour interval has been shown by operating practice to be sufficient to regularly assess RCS loop status. In addition, control room indication and alarms will normally indicate loop status.

Insert 3

SR 3.4.6.2

Verification that the required pump is OPERABLE ensures that an additional RCS or DHR loop can be placed in operation if needed to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pumps. The Frequency of 7 days is considered reasonable in view of other administrative controls and has been shown to be acceptable by operating experience.

REFERENCES

1. 10 CFR 50.36.

BASES (continued)

APPLICABILITY (continued)	LCO 3.4.6, "RCS Loops – MODE 4"; LCO 3.4.8, "RCS Loops – MODE 5, Loops Not Filled"; LCO 3.9.4, "Decay Heat Removal (DHR) and Coolant Circulation – High Water Level" (MODE 6); and LCO 3.9.5, "Decay Heat Removal (DHR) and Coolant Circulation – Low Water Level" (MODE 6).

ACTIONS

A.1 and A.2

If one required DHR loop is inoperable and any required SG has secondary side water level < 50%, redundancy for heat removal is lost. Action must be initiated to restore a second DHR loop to OPERABLE status or initiate action to restore the secondary side water level in the SGs, and action must be taken immediately. Either Required Action A.1 or Required Action A.2 will restore redundant decay heat removal paths. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal.

B.1 and B.2

If no required DHR loop is in operation (no DHR loop is required to be in operation provided the conditions of Note 1 are met), or no required DHR loop is OPERABLE, all operations involving the reduction of RCS boron concentration must be suspended and action to restore a DHR loop to OPERABLE status and operation must be initiated. Boron dilution requires forced circulation for proper mixing, and the margin to criticality must not be reduced in this type of operation. The immediate Completion Time reflects the importance of maintaining operation for decay heat removal.

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1

This SR requires verification ~~every 12 hours~~ that the required DHR loop is in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. ~~The 12 hour Frequency has been shown by operating practice to be sufficient to regularly assess degradation.~~ Insert 3 In addition, control room indication and alarms will normally indicate loop status.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.7.2

Verifying the SGs are OPERABLE by ensuring their secondary side water levels are ≥ 50% ensures that redundant heat removal paths are available if the second DHR loop is not OPERABLE. If both DHR loops are OPERABLE, this Surveillance is not needed. The 12 hour Frequency has been shown by operating practice to be sufficient to regularly assess degradation and verify operation within safety analyses assumptions.

Insert 3

SR 3.4.7.3

Verification that each required DHR pump is OPERABLE ensures that a DHR loop can be placed in operation if needed to maintain decay heat removal and reactor coolant circulation. If the secondary side water level is ≥ 50% in both SGs, this Surveillance is not needed. Verification is performed by verifying proper breaker alignment and power available to the required pumps. The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience.

REFERENCES

1. 10 CFR 50.36.

Amendment Nos.

BASES (continued)

APPLICABILITY (continued)	LCO 3.4.6, "RCS Loops – MODE 4"; LCO 3.4.7, "RCS Loops – MODE 5, Loops Filled"; LCO 3.9.4, "Decay Heat Removal (DHR) and Coolant Circulation – High Water Level" (MODE 6); and LCO 3.9.5, "Decay Heat Removal (DHR) and Coolant Circulation – Low Water Level" (MODE 6).

ACTIONS

A.1

If one required DHR loop is inoperable, redundancy for heat removal is lost. Required Action A.1 is to immediately initiate activities to restore a second loop to OPERABLE status. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal.

B.1 and B.2

If no required loop is OPERABLE or the required loop is not in operation, (no loop is required to be in operation provided the conditions of Note 1 in the LCO are met), the Required Action requires immediate suspension of all operations involving boron reduction and requires initiation of action to immediately restore one DHR loop to OPERABLE status and operation. The Required Action for restoration does not apply to the condition of both loops not in operation when the exception Note in the LCO is in force. The immediate Completion Time reflects the importance of maintaining operations for decay heat removal. The action to restore must continue until one loop is restored.

SURVEILLANCE REQUIREMENTS

SR 3.4.8.1

This Surveillance requires verification every 12 hours that the required loop is in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The 12 hour interval has been shown by operating practice to be sufficient to regularly assess degradation and verify operation within safety analyses assumptions.

Insert 3

SR 3.4.8.2

Verification that the required number of pumps are OPERABLE ensures that redundancy for heat removal is provided. The requirement also ensures that additional loops can be placed in operation if needed to

Amendment Nos

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.8.2 (continued)

maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pumps. The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience.

Insert 3

REFERENCES

1. Generic Letter 88-17, October 17, 1988.
2. 10 CFR 50.36.

Amendment Nos.

BASES

ACTIONS (continued)

Twelve hours is a reasonable time based upon operating experience to reach MODE 3 from full power without challenging unit systems and operators. Further pressure and temperature reduction to MODE 3 with RCS temperature ≤ 325°F places the unit into a MODE where the LCO is not applicable. The 18 hour Completion Time to reach the nonapplicable MODE is reasonable based upon operating experience.

C.1

If the power supplies to the heaters are not capable of providing 400 kW, or the pressurizer heaters are inoperable, restoration is required in 72 hours. The Completion Time of 72 hours is reasonable considering the anticipation that a demand will not occur in this period.

D.1 and D.2

If pressurizer heater capability cannot be restored within the allowed Completion Time of Required Action C.1, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to MODE 3 within 12 hours and to MODE 3 with RCS temperature ≤ 325°F within the following 6 hours. The Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems. Similarly, the Completion Time of 18 hours to be in MODE 3 with RCS temperature ≤ 325°F is reasonable based on operating experience to achieve power reduction from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

This SR requires that during steady state operation, pressurizer water level is maintained below the nominal upper limit to provide a minimum space for a steam bubble. The Surveillance is performed by observing the indicated level. ~~The 12 hour interval has been shown by operating practice to be sufficient to regularly assess the level for any deviation and verify that operation is within safety analyses assumptions.~~ Insert 3 Alarms are also available for early detection of abnormal level indications.

SR 3.4.9.2

The SR verifies the power supplies are capable of producing the minimum power and the associated pressurizer heaters are at their design rating. (This may be done by testing the power supply output and heater current,

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)	or by performing an electrical check on heater element continuity and resistance.) ~~The Frequency of 18 months is considered adequate to detect heater degradation and has been shown by operating experience to be acceptable.~~
Insert 3	
REFERENCES	1. 10 CFR 50.36.
	2. NUREG-0737, November 1980.

Amendment Nos.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.11.1

SR 3.4.11.1 requires performing a gamma isotopic analysis as a measure of the gross specific activity of the reactor coolant at least once per 7 days. While basically a quantitative measure of radionuclides with half lives longer than 30 minutes, excluding iodines, this measurement is the sum of the degassed gamma activities and the gaseous gamma activities in the sample taken. This Surveillance provides an indication of any increase in gross specific activity.

Trending the results of this Surveillance allows proper remedial action to be taken before reaching the LCO limit under normal operating conditions. The Surveillance is applicable in MODES 1 and 2, and in MODE 3 with RCS average temperature at least 500°F. ~~The 7 day Frequency considers the unlikelihood of a gross fuel failure during that time period.~~

Insert 3

SR 3.4.11.2

This Surveillance is performed in MODE 1 only to ensure the iodine remains within limit during normal operation and following fast power changes when fuel failure is more apt to occur. ~~The 14 day Frequency is adequate to trend changes in the iodine activity level considering gross specific activity is monitored every 7 days.~~ The Frequency, between 2 and 6 hours after a power change of ≥ 15% RTP within a 1 hour period, is established because the iodine levels peak during this time following fuel failure; samples at other times would provide inaccurate results.

SR 3.4.11.3

SR 3.4.11.3 requires radiochemical analysis for $\bar{E}$ determination every 184 days (6 months) with the unit operating in MODE 1 equilibrium conditions. The $\bar{E}$ determination directly relates to the LCO and is required to verify unit operation within the specific gross activity LCO limit. The analysis for $\bar{E}$ is a measurement of the average energies per disintegration for isotopes with half lives longer than 30 minutes, excluding iodines. ~~The Frequency of 184 days recognizes $\bar{E}$ does not change rapidly.~~

This SR has been modified by a Note that requires sampling to be performed 31 days after a minimum of 2 EFPD and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for at least 48 hours. This ensures the radioactive materials are at equilibrium so the analysis for $\bar{E}$ is representative and not skewed by a crud burst or other similar abnormal event.

BASES

ACTIONS

F.1 and G.1 (continued)

RCS vent path capable of mitigating the most limiting LTOP event must be established within 12 hours. These Completion Times also consider that these activities can be accomplished in these time periods. A limiting LTOP event is not likely in these periods.

H.1 and H.2

With administrative controls which assure ≥ 10 minutes are available to mitigate the consequences of an LTOP event not implemented and the PORV inoperable; or the LTOP System inoperable for any reason other than cited in Condition A through G, the system must be restored to OPERABLE status within one hour. When this is not possible, Required Action H.2 requires the RCS depressurized and vented within 12 hours.

One or more vents may be used. A vent path capable of mitigating the most limiting LTOP event is specified. Because makeup may be required, the vent size accommodates inadvertent full makeup system operation. Such a vent keeps the pressure from full flow of the makeup pump(s) with a wide open makeup control valve within the LCO limit.

The Completion Time is based on operating experience that these activity can be accomplished in this time period and on engineering judgement indicating that a limiting LTOP transient is not likely in this time.

SURVEILLANCE REQUIREMENTS

SR 3.4.12.1 and SR 3.4.12.2

Verifications must be performed that HPI is deactivated, and the CFTs are isolated. These Surveillances ensure the minimum coolant input capability will not create an RCS overpressure condition to challenge the LTOP System. The Surveillances are required at 12 hour intervals. The 12 hour intervals are shown by operating practice to be sufficient to regularly assess conditions for potential degradation and verify operation within the safety analysis.

Insert 3

SR 3.4.12.3

Verification that the pressurizer level is less than the volume necessary to assure ≥ 10 minutes are available for operator action to mitigate an LTOP event by observing control room or other indications ensures a cushion of sufficient size is available to reduce the rate of pressure increase from potential transients.

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.3 (continued)

The 30 minute Surveillance Frequency during heatup and cooldown must be performed for the LCO Applicability period when temperature changes can cause pressurizer level variations. This Frequency may be discontinued when the ends of these conditions are satisfied, as defined in plant procedures. ~~Thereafter, the Surveillance is required at 12 hour intervals.~~

~~These Frequencies are shown by operating practice sufficient to regularly assess indications of potential degradation and verify operation within the safety analysis.~~

The subsequent Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.12.4

Verification that the PORV block valve is open ensures a flow path to the PORV. ~~This is required at 12 hour intervals.~~

~~The interval has been shown by operating practice to be sufficient to regularly assess conditions for potential degradation and verify operation is within the safety analysis.~~

Insert 3

SR 3.4.12.5

A CHANNEL FUNCTIONAL TEST is required ~~every 31 days~~ periodically. PORV actuation is not needed, as it could depressurize the RCS.

~~The 31 day Frequency is based on industry accepted practice and is acceptable by experience with equipment reliability.~~

SR 3.4.12.6

Verification that administrative controls, other than limits for pressurizer level, that assure ≥ 10 minutes are available for operator action to mitigate the consequences of an LTOP event are implemented is necessary ~~every 12 hours~~. This verification consists of a combination of administrative checks for alarm availability, verification that pressurizer heater bank 3 or 4 is deactivated, appropriate restrictions on pressurizer level, controls for High Pressure Nitrogen, etc., as well as visual confirmation using available indications that associated physical parameters are within limits.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.6 (continued)

Insert 3

The Frequency is shown by operating practice sufficient to regularly assess indications of potential degradation and verify operation within the safety analysis.

SR 3.4.12.7

The performance of a CHANNEL CALIBRATION is required every 6 months. The CHANNEL CALIBRATION for the LTOP setpoint ensures that the PORV will be actuated at the appropriate RCS pressure by verifying the accuracy of the instrument string.

REFERENCES

1. 10 CFR 50, Appendix G.
2. Generic Letter 88-11.
3. UFSAR, 5.2.3.7.
4. 10 CFR 50.36.

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.13.1 (continued)

Steady state operation is required to perform a proper water inventory balance since calculations during maneuvering are not useful. For RCS operational LEAKAGE determination by water inventory balance, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP pump seal injection and return flows.

An early warning of LEAKAGE is provided by the automatic systems that monitor the containment atmosphere radioactivity and the containment sump level.

These leakage detection systems are specified in LCO 3.4.15, "RCS Leakage Detection Instrumentation."

Note 2 states that this SR is not applicable to primary to secondary LEAKAGE because LEAKAGE of 150 gallons per day cannot be measured accurately by an RCS water inventory balance.

Insert 3

The 72 hour Frequency is a reasonable interval to trend LEAKAGE and recognizes the importance of early leakage detection in the prevention of accidents.

SR 3.4.13.2

This SR verifies that primary to secondary LEAKAGE is less than or equal to 150 gallons per day through any one SG. Satisfying the primary to secondary LEAKAGE limit ensures that the operational LEAKAGE performance criterion in the Steam Generator Program is met. If this SR is not met, compliance with this LCO, as well as LCO 3.4.16, "Steam Generator Tube Integrity," should be evaluated. The 150 gallons per day limit is measured at room temperature as described in Ref. 5. The operational LEAKAGE rate limit applies to LEAKAGE through any one SG. If it is not practical to assign the LEAKAGE to an individual SG, all the primary to secondary LEAKAGE should be conservatively assumed to be from one SG.

The Surveillance is modified by a Note which states that the Surveillance is not required to be performed until 12 hours after establishment of steady state operation. For RCS primary to secondary LEAKAGE determination, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.13.2 (continued)

Insert 3

The Surveillance Frequency of 72 hours is a reasonable interval to trend primary to secondary LEAKAGE and recognizes the importance of early leakage detection in the prevention of accidents. The primary to secondary LEAKAGE is determined using continuous process radiation monitors or radiochemical grab sampling in accordance with the EPRI guidelines (Ref. 5).

REFERENCES

1. UFSAR, Section 3.1.

2. UFSAR, Chapter 15.

3. 10 CFR 50.36.

4. NEI 97-06, "Steam Generator Program Guidelines."

5. EPRI, "Pressurized Water Reactor Primary-to-Secondary Leak Guidelines."

BASES

ACTIONS

A.1 and A.2 (continued)

Required Action A.2 specifies that the double isolation barrier of two valves be restored by closing some other valve qualified for isolation. The 72 hour time after exceeding the limit considers the time required to complete the Action and the low probability of a second valve failing during this time period.

B.1 and B.2

If Required Actions and associated Completion Times are not met, the unit must be brought to a MODE in which the requirement does not apply. To achieve this status, the unit must be brought to MODE 3 within 12 hours and to MODE 5 within 36 hours. This Required Action may reduce the leakage and also reduces the potential for a LOCA outside the containment. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.14.1

Performance of leakage testing on each required RCS PIV or isolation valve used to satisfy Required Action A.1 or A.2 is required to verify that leakage is below the specified limit and to identify each leaking valve. The leakage limit of 0.5 gpm per inch of nominal valve diameter up to 5 gpm maximum applies to each valve. Leakage testing requires a stable pressure condition.

For the two PIVs in series, the leakage requirement applies to each valve individually and not to the combined leakage across both valves. If the PIVs are not individually leakage tested, one valve may have failed completely and not detected if the other valve in series meets the leakage requirement. In this situation, the protection provided by redundant valves would be lost.

prior to entering MODE 2 whenever the unit has been in MODE 5 for ≥ 7 days, if leakage testing has not been performed in the previous 9 months.

in accordance with the Surveillance Frequency Control program and

Testing is to be performed ~~every 18 months, a typical refueling cycle, if the unit does not go into MODE 5 for at least 7 days.~~ ~~The 18 month Frequency is consistent with 10 CFR 50.55a(g) (Ref. 8) as contained in the Inservice Testing Program, is within frequency allowed by the American Society of Mechanical Engineers (ASME) Code, Section XI (Ref. 7), and is based on the need to perform such surveillances under conditions that apply during an outage and the potential for an unplanned transient if the Surveillance were performed with the unit at power.~~

Insert 3

BASES

REFERENCES (continued)	7.	ASME, Boiler and Pressure Vessel Code, Section XI.
	8.	~~10 CFR 50.55a(g).~~

BASES

ACTIONS

B.1.1, B.1.2, and B.2 (continued)

The 24 hour interval for SR 3.4.13.1 provides periodic information that is adequate to detect leakage. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established. The 30 day Completion Time recognizes at least one other form of leak detection is available.

C.1 and C.2

If a Required Action of Condition A or B cannot be met within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

D.1

If both required leakage detection instruments are inoperable, no automatic means of monitoring leakage are available, and immediate plant shutdown in accordance with LCO 3.0.3 is required.

SURVEILLANCE REQUIREMENTS

SR 3.4.15.1

SR 3.4.15.1 requires the performance of a CHANNEL CHECK of the required containment atmosphere radioactivity monitor. The check gives reasonable confidence that the channel is operating properly. ~~The Frequency of 12 hours is based on instrument reliability and is reasonable for detecting off normal conditions.~~

Insert 3

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a CHANNEL FUNCTIONAL TEST of the required containment atmosphere radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. The test verifies the alarm setpoint and relative accuracy of the instrument string. The Frequency of 92 days considers instrument reliability, and operating experience has shown it proper for detecting degradation.

SR 3.4.15.3 and SR 3.4.15.4

These SRs require the performance of a CHANNEL CALIBRATION for each of the required RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. The Frequency of 18 months is a typical refueling cycle and considers channel reliability. Industry operating experience has proven this Frequency is acceptable.

Insert 3

REFERENCES

1. UFSAR, Section 3.1.
2. 10 CFR 50.36.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.2 and SR 3.5.1.3

Insert 3

Verification every 12 hours of each CFT's nitrogen cover pressure (≥ 575 psig and ≤ 625 psig) and the borated water volume (≥ 1010 ft^3 and ≤ 1070 ft^3) is sufficient to ensure adequate injection during a LOCA. A CFT level of ≥ 12.56 ft and ≤ 13.44 ft corresponds to the specified borated water volume. Due to the static design of the CFTs, a 12 hour Frequency usually allows the operator to identify changes before the limits are reached. Operating experience has shown that this Frequency is appropriate for early detection and correction of off normal trends.

SR 3.5.1.4

Surveillance once every 31 days is reasonable to verify that the CFT boron concentration is within the required limits, because the static design of the CFT limits the ways in which the concentration can be changed. The Frequency is adequate to identify changes that could occur from mechanisms such as stratification or inleakage. Verifying CFT boron concentration within 12 hours after an 80 gallon volume increase will identify whether inleakage from the RCS has caused a reduction in boron concentration to below the required limit. The 80 gallon increase represents approximately 1% increase in volume. It is not necessary to verify boron concentration if the added water inventory is from a borated water source that meets CFT boron concentration requirements, such as the boric acid mix tank or the borated water storage tank (BWST). This is consistent with the recommendations of NUREG-1366 (Ref. 4).

SR 3.5.1.5

Verification every 31 days that power is removed from each CFT isolation valve operator ensures that an active failure could not result in the undetected closure of a CFT motor operated isolation valve coincident with a LOCA. Since power is removed under administrative control, the 31 day Frequency will provide adequate assurance that the power is removed.

BASES

ACTIONS (continued)

B.1

If one CFT is inoperable for a reason other than boron concentration, the CFT must be returned to OPERABLE status within 1 hour. In this condition it cannot be assumed that the CFT will perform its required function during a LOCA. Due to the severity of the consequences should a LOCA occur in these conditions, the 1 hour Completion Time to open the valve, remove power to the valve, or restore the proper water volume or nitrogen cover pressure ensures that prompt action will be taken to return the inoperable CFT to OPERABLE status. The Completion Time minimizes the time the unit is potentially exposed to a LOCA in these conditions.

C.1 and C.2

If the Required Actions and associated Completion Times of Condition A or B are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and RCS pressure reduced to ≤ 800 psig within 18 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

D.1

If more than one CFT is inoperable, the unit is in a condition outside the accident analysis; therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

Verification every 12 hours that each CFT isolation valve is fully open ensures that the CFTs are available for injection and ensures timely discovery if a valve should be less than fully open. If an isolation valve is not fully open, the rate of injection to the RCS would be reduced. Although a motor operated valve position should not change with power removed, a closed valve could result in accident analysis assumptions not being met.

Insert 3

A 12 hour Frequency is considered reasonable in view of administrative controls that ensure that a mispositioned isolation valve is unlikely.

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.1

Verifying the correct alignment for manual and non-automatic power operated valves in the HPI flow paths provides assurance that the proper flow paths will exist for HPI operation. This SR does apply to the HPI suction header cross-connect valves, the HPI discharge cross-connect valves, the HPI discharge crossover valves, and the LPI-HPI flow path discharge valves (LP-15 and LP-16). This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. Similarly, this SR does not apply to automatic valves since automatic valves actuate to their required position upon an accident signal. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. The 31 day Frequency is appropriate because the valves are operated under administrative control. This Frequency has been shown to be acceptable through operating experience.

Insert 3

SR 3.5.2.2

With the exception of the HPI pump operating to provide normal makeup, the other two HPI pumps are normally in a standby, non-operating mode. As such, the emergency injection flow path piping has the potential to develop voids and pockets of entrained gases. Venting the HPI pump casings periodically reduces the potential that such voids and pockets of entrained gases can adversely affect operation of the HPI System. This will also reduce the potential for water hammer, pump cavitation, and pumping of noncondensible gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following an ESPS signal. This Surveillance is modified by a Note that indicates it is not applicable to operating HPI pump(s) providing normal makeup. The 31 day Frequency takes into consideration the gradual nature of gas accumulation in the HPI piping and the existence of procedural controls governing system operation.

SR 3.5.2.3

Periodic surveillance testing of HPI pumps to detect gross degradation caused by impeller structural damage or other hydraulic component problems is required by Section XI of the ASME Code (Ref. 5). SRs are specified in the Inservice Testing Program, which encompasses Section XI of the ASME Code.

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.4 and SR 3.5.2.5

These SRs demonstrate that each automatic HPI valve actuates to the required position on an actual or simulated ESPS signal and that each HPI pump starts on receipt of an actual or simulated ESPS signal. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. The test will be considered satisfactory if control board indication verifies that all components have responded to the ESPS actuation signal properly (all appropriate ESPS actuated pump breakers have opened or closed and all ESPS actuated valves have completed their travel). The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The 18 month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment. The actuation logic is tested as part of the ESPS testing, and equipment performance is monitored as part of the Inservice Testing Program.

Insert 3

SR 3.5.2.6

Periodic inspections of the reactor building sump suction inlet (for LPI-HPI flow path) ensure that it is unrestricted and stays in proper operating condition. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage, on the need to preserve access to the location, and on the potential for an unplanned transient if the Surveillance were performed with the reactor at power. This Frequency has been found to be sufficient to detect abnormal degradation and has been confirmed by operating experience.

SR 3.5.2.7

Periodic stroke testing of the HPI discharge crossover valves (HP-409 and HP-410) and LPI-HPI flow path discharge valves (LP-15 and LP-16) is required to ensure that the valves can be manually cycled from the Control Room. This test is performed on an 18 month Frequency. Operating experience has shown that these components usually pass the surveillance when performed at this Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

Amendment Nos.

BASES

ACTIONS

D.2 (continued)

Required Action D.2 requires that the unit be placed in MODE 5 within 24 hours. This Required Action is modified by a Note that states that the Required Action is only required to be performed if a DHR loop is OPERABLE. This Required Action provides for those circumstances where the LPI trains may be inoperable but otherwise capable of providing the necessary decay heat removal. Under this circumstance, the prudent action is to remove the unit from the Applicability of the LCO and place the unit in a stable condition in MODE 5. The Completion Time of 24 hours is reasonable, based on operating experience, to reach MODE 5 in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.5.3.1

Verifying the correct alignment for manual and non-automatic power operated valves in the LPI flow paths provides assurance that the proper flow paths will exist for LPI operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. Similarly, this SR does not apply to automatic valves since automatic valves actuate to their required position upon an accident signal. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. The 31 day Frequency is appropriate because the valves are operated under administrative control, and an inoperable valve position would only affect a single train. This Frequency has been shown to be acceptable through operating experience.

Insert 3

When in MODE 4 an LPI train may be considered OPERABLE during alignment, when aligned or when operating for decay heat removal if capable of being manually realigned to the LPI mode of operation.

Therefore, for this condition, the SR verifies that LPI is capable of being manually realigned to the LPI mode of operation.

SR 3.5.3.2

With the exception of systems in operation, the LPI pumps are normally in a standby, non-operating mode. As such, the flow path piping has the potential to develop voids and pockets of entrained gases. Venting the LPI pump casings periodically reduces the potential that such voids and pockets of entrained gases can adversely affect operation of the LPI System. This will also minimize the potential for water hammer, pump

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.3.2 (continued)

cavitation, and pumping of noncondensible gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following an ESPS signal or during shutdown cooling. This Surveillance is modified by a Note that indicates it is not applicable to operating LPI pump(s). The 31 day Frequency takes into consideration the gradual nature of gas accumulation in the LPI piping and the existence of procedural controls governing system operation.

Insert 3

SR 3.5.3.3

Periodic surveillance testing of LPI pumps to detect gross degradation caused by impeller structural damage or other hydraulic component problems is required by Section XI of the ASME Code (Ref. 6). SRs are specified in the Inservice Testing Program, which encompasses Section XI of the ASME Code.

SR 3.5.3.4 and SR 3.5.3.5

These SRs demonstrate that each automatic LPI valve actuates to the required position on an actual or simulated ESPS signal and that each LPI pump starts on receipt of an actual or simulated ESPS signal. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. The test will be considered satisfactory if control board indication verifies that all components have responded to the ESPS actuation signal properly (all appropriate ESPS actuated pump breakers have opened or closed and all ESPS actuated valves have completed their travel). The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The 18 month Frequency is also acceptable based on consideration of the design reliability (and confirming operating experience) of the equipment.

The actuation logic is tested as part of the ESPS testing, and equipment performance is monitored as part of the Inservice Testing Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.3.6

Insert 3

Periodic inspections of the reactor building sump suction inlet ensure that it is unrestricted and stays in proper operating condition. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage, on the need to preserve access to the location, and on the potential for an unplanned transient if the Surveillance were performed with the reactor at power. This Frequency has been found to be sufficient to detect abnormal degradation and has been confirmed by operating experience.~~

REFERENCES

1. 10 CFR 50.46.
2. UFSAR, Section 15.14.3.3.6.
3. UFSAR, Section 15.14.3.3.5.
4. 10 CFR 50.36.
5. NRC Memorandum to V. Stello, Jr., from R.L. Baer, "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.
6. ASME, Boiler and Pressure Vessel Code, Section XI, Inservice Inspection, Article IWV-3400.
7. NRC Safety Evaluation of Babcock & Wilcox Owners Group (B&WOG) Topical Report BAW-2295, Revision 1, "Justification for the Extension of Allowed Outage Time for Low Pressure Injection and Reactor Building Spray systems," (TAC No. MA3807) dated June 30, 1999.

BASES

ACTIONS (continued)

B.1

With the BWST inoperable for reasons other than Condition A (e.g., water volume), the BWST must be restored to OPERABLE status within 1 hour. In this condition, neither the ECCS nor the Reactor Building Spray System can perform its design functions. Therefore, prompt action must be taken to restore the BWST to OPERABLE status or to place the unit in a MODE in which the BWST is not required. The allowed Completion Time of 1 hour to restore the BWST to OPERABLE status is based on this condition simultaneously affecting multiple redundant trains.

C.1 and C.2

If the Required Action and associated Completion Time are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.5.4.1

Verification every 24 hours that the BWST water temperature is within the specified temperature band ensures that the fluid will not freeze and that the fluid temperature entering the reactor vessel will not be colder than assumed in the reactor vessel stress analysis; and the fluid temperature entering the reactor vessel will not be hotter than assumed in the LOCA analysis. The 24 hour Frequency is sufficient to identify a temperature change that would approach either temperature limit and has been shown to be acceptable through operating experience.

Insert 3

The SR is modified by a Note that requires the Surveillance to be performed only when ambient air temperatures are outside the operating temperature limits of the BWST. With ambient temperature within this band, the BWST temperature should not exceed the limits.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.4.2

Verification every 7 days that the BWST contained volume is ≥ 350,000 gallons (46.0 ft.) ensures that a sufficient initial supply is available for injection and to support continued ECCS pump operation on recirculation. Since the BWST volume is normally stable, a 7 day Frequency has been shown to be appropriate through operating experience.

Insert 3

SR 3.5.4.3

Verification every 7 days that the boron concentration of the BWST fluid is within the required band ensures that the reactor will remain subcritical following a LOCA. Since the BWST volume is normally stable, a 7 day sampling Frequency is appropriate and has been shown to be acceptable through operating experience. The COLR revision process assures that the minimum boron concentration specified in the COLR bounds the limit specified by this SR.

REFERENCES 1. 10 CFR 50.36.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.2 (continued)

the interlock will function as designed and that simultaneous opening of the inner and outer doors will not inadvertently occur. ~~Due to the purely mechanical nature of this interlock, and given that the interlock mechanism is not normally challenged when the containment air lock door is used for entry or exit (procedures require strict adherence to single door opening), this test is only required to be performed every 18 months. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage, and the potential loss of containment OPERABILITY if the Surveillance were performed with the reactor at power. Operating experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency. The 18 month Frequency is based on engineering judgment and is considered adequate given that the interlock is not challenged during use of the air lock.~~

Insert 3

REFERENCES

1. 10 CFR 50, Appendix J, Option A and B.
2. UFSAR, Section 15.14.
3. UFSAR, Section 6.2.
4. 10 CFR 50.36.
5. ~~Duke Power Company letter from William O. Parker, Jr. to Harold R. Denton (NRC) dated July 24, 1981.~~
6. ~~NRC Letter from Philip C. Wagner to William O. Parker, Jr., dated November 6, 1981, Issuance of Amendment 104, 104 and 101 to Licenses DPR-38, DPR-47 and DPR-55 for the Oconee Nuclear Station Units Nos 1, 2 and 3.~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1

periodically

Each 48 inch reactor building purge valve is required to be verified sealed closed at 31 day intervals. This Surveillance is designed to ensure that a gross breach of containment is not caused by an inadvertent or spurious opening of a reactor building purge valve. Detailed analysis of the purge valves failed to conclusively demonstrate their ability to close during a LOCA in time to limit offsite doses. Therefore, these valves are required to be in the sealed closed position during MODES 1, 2, 3, and 4. A reactor building purge valve that is sealed closed must have motive power to the valve operator removed. This can be accomplished by de-energizing the source of electric power or by removing the air supply to the valve operator.

Insert 3

In this application, the term "sealed" has no connotation of leak tightness. The 31 day Frequency is consistent with other containment isolation valve requirements discussed in SR 3.6.3.2.

SR 3.6.3.2

This SR requires verification that each containment isolation manual and non-automatic power operated valve and blind flange located outside containment and not locked, sealed, or otherwise secured, and required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside the containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those containment isolation valves outside containment and capable of being mispositioned are in the correct position. Since verification of valve position for containment isolation valves outside containment is relatively easy, the 31 day Frequency is based on engineering judgment and was chosen to provide added assurance of the correct positions. The SR specifies that containment isolation valves open under administrative controls are not required to meet the SR during the time the valves are open. The opening of locked or sealed closed containment isolation valves on an intermittent basis under administrative control includes the following: (1) stationing an operator, who is in constant communication with control room, at the valve controls, (2) instructing this operator to close these valves in an accident situation, and (3) assuring that environmental conditions will not preclude access to close the valves and that this action will prevent the release of radioactivity outside the containment (Ref. 5). The dedicated individual can be responsible for closing more than one valve provided that the valves are all in close vicinity and can be closed in a timely manner. This SR does not apply to valves that are locked, sealed, or otherwise secured, since these were verified to be in the correct position upon locking, sealing, or securing.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.4

Verifying that the isolation time of each automatic power operated containment isolation valve is within limits is required to demonstrate OPERABILITY. The isolation time and Frequency of this SR are in accordance with the Inservice Testing Program.

SR 3.6.3.5

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following an accident. This SR ensures that each automatic containment isolation valve will actuate to its isolation position on a containment isolation signal. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass this Surveillance when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

Insert 3

REFERENCES

1. UFSAR, Section 6.2.
2. UFSAR, Section 15.14.
3. 10 CFR 50.36.
4. UFSAR, Table 6-7.
5. Generic Letter 91-08

BASES

ACTIONS (continued)

B.1 and B.2

If the Required Action and associated Completion Time is not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1

Verifying that containment pressure is within limits ensures that operation remains within the limits assumed in the containment analysis. ~~The 12 hour Frequency of this SR was developed after taking into consideration operating experience related to trending of containment pressure variations during the applicable MODES. Furthermore, the 12 hour Frequency is considered adequate in view of other indications available in the control room to alert the operator to an abnormal containment pressure condition.~~

Insert 3

REFERENCES

1. UFSAR, Chapter 15.
2. UFSAR, Section 6.2.
3. 10 CFR 50, Appendix K.
4. 10 CFR 50.36.

Amendment Nos.

BASES

ACTIONS

G.1 (continued)

conditions from full power conditions in an orderly manner and without challenging unit systems.

H.1

With two reactor building spray trains, two reactor building cooling trains or any combination of three or more reactor building spray and reactor building cooling trains inoperable in MODE 1 or 2, the unit is in a condition outside the accident analysis. Therefore, LCO 3.0.3 must be entered immediately.

With any combination of two or more required reactor building spray and reactor building cooling trains inoperable in MODE 3 or 4, the unit is in a condition outside the accident analysis. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1

Verifying the correct alignment for manual and non-automatic power operated valves in the reactor building spray and cooling flow path provides assurance that the proper flow paths will exist for Reactor Building Spray and Cooling System operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. Similarly, this SR does not apply to automatic valves since automatic valves actuate to their required position upon an accident signal. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those valves outside containment and capable of potentially being mispositioned are in the correct position.

Insert 3

SR 3.6.5.1 is modified by a note that states the SR is applicable for Reactor Building Cooling system following completion of the LPSW RB Waterhammer Modification on the respective Unit.

SR 3.6.5.2

Operating each required reactor building cooling train fan unit for $\geq$ 15 minutes ensures that all trains are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.5.2 (continued)

Insert 3

The 31 day Frequency was developed considering the known reliability of the fan units and controls, the three train redundancy available, and the low probability of a significant degradation of the reactor building cooling trains occurring between surveillances and has been shown to be acceptable through operating experience.

SR 3.6.5.3

Verifying that each required Reactor Building Spray pump's developed head at the flow test point is greater than or equal to the required developed head ensures that spray pump performance has not degraded during the cycle. Flow and differential pressure are normal tests of centrifugal pump performance required by Section XI of the ASME Code (Ref. 4). Since the Reactor Building Spray System pumps cannot be tested with flow through the spray headers, they are tested on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and may detect incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

SR 3.6.5.4

Verifying the containment heat removal capability provides assurance that the containment heat removal systems are capable of maintaining containment temperature below design limits following an accident. This test verifies the heat removal capability of the Low Pressure Injection (LPI) Coolers and Reactor Building Cooling Units. The 18 month Frequency was developed considering the known reliability of the low pressure service water, reactor building spray and reactor building cooling systems and other testing performed at shorter intervals that is intended to identify the possible loss of heat removal capability.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.5.5 and 3.6.5.6

These SRs require verification that each automatic reactor building spray and cooling valve actuates to its correct position and that each reactor building spray pump starts upon receipt of an actual or simulated actuation signal. The test will be considered satisfactory if visual observation and control board indication verifies that all components have responded to the actuation signal properly; the appropriate pump breakers have closed, and all valves have completed their travel. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. ~~The 18 month Frequency is based on the need to perform these Surveillances under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillances were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillances when performed at the 18 month Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.~~

Insert 3

SR 3.6.5.5 is modified by a note that states the SR is applicable for Reactor Building Cooling system following completion of the LPSW RB Waterhammer Modification on the respective Unit.

SR 3.6.5.7

This SR requires verification that each required reactor building cooling train actuates upon receipt of an actual or simulated actuation signal. The test will be considered satisfactory if control board indication verifies that all components have responded to the actuation signal properly, the appropriate valves have completed their travel, and fans are running at half speed. ~~The 18 month Frequency is based on engineering judgment and has been shown to be acceptable through operating experience. See SR 3.6.5.5 and SR 3.6.5.6, above, for further discussion of the basis for the 18 month Frequency.~~

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.5.8

With the reactor building spray header isolated and drained of any solution, station compressed air is introduced into the spray headers to verify the availability of the headers and spray nozzles. Performance of this Surveillance demonstrates that each spray nozzle is unobstructed and provides assurance that spray coverage of the containment during an accident is not degraded. Due to the passive nature of the design of the nozzles, a test at 10 year intervals is considered adequate to detect obstruction of the spray nozzles.

Insert 3

REFERENCES

1. UFSAR, Section 3.1.
2. UFSAR, Section 6.2.
3. 10 CFR 50.36.
4. ASME, Boiler and Pressure Vessel Code, Section XI.

BASES

ACTIONS

C.1 and C.2 (continued)

Inoperable TSVs that cannot be restored to OPERABLE status within the specified Completion Time, but are closed, must be verified on a periodic basis to be closed. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of TSV status indications available in the control room, and other administrative controls, to ensure these valves are in the closed position.

D.1 and D.2

If the TSV cannot be restored to OPERABLE status or closed in the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 18 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from MODE 2 conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1 and SR 3.7.2.2

These SRs verify that TSV closure time of each TSV is ≤ 1.0 second on an actual or simulated actuation signal from Channel A and Channel B. The 1.0 second TSV closure time is assumed in the accident and containment analyses. This Surveillance is normally performed upon returning the unit to operation following a refueling outage.

Insert 3

The Frequency for this SR is 18 months. The 18 month Frequency to demonstrate valve closure time is based on the refueling cycle. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

This test is conducted in MODE 3, with the unit at operating temperature and pressure, as discussed in the Reference 5 exercising requirements. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows delaying testing until MODE 3 in order to establish conditions consistent with those under which the acceptance criterion was generated.

BASES

ACTIONS

A.1 and A.2

With one or both of the ADV flow path(s) inoperable, the Unit must be placed in a condition in which the LCO does not apply. To achieve this status, the Unit must be placed in at least MODE 3 within 12 hours, and at least MODE 4 without reliance on a steam generator for heat removal within 24 hours. The Completion Times are reasonable, based on operating experience, to reach the required Unit conditions from full power conditions in an orderly manner and without challenging Unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.4.1

To perform a controlled cool down of the RCS, the valves that comprise the ADV flow path for each steam generator must be able to perform the following functions:

a) the atmospheric dump block valve bypass and the atmospheric vent valve must be capable of being opened and closed; and

b) the atmospheric dump control valve and atmospheric vent block valve must be capable of being opened and throttled through their full range.

This SR ensures that the valves that comprise the ADV flow path for each steam generator are cycled through the full control range at least once per 18 months. Performance of inservice testing or use of an ADV flow path during a unit cool down satisfies this requirement. This surveillance does not require the valves to be tested at pressure. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

Insert 3

REFERENCES

1. 10 CFR 50.36.
2. UFSAR, Section 10.3.
3. UFSAR, Section 15.9.
4. UFSAR, Section 15.12
5. UFSAR, Section 15.14

Amendment Nos.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

Verifying the correct alignment for manual, and non-automatic power operated valves in the EFW water and steam supply flow paths provides assurance that the proper flow paths exist for EFW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since those valves are verified to be in the correct position prior to locking, sealing, or securing.

This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position.

Insert 3

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.5.2

Verifying that each EFW pump's developed head at the flow test point is greater than or equal to the required developed head ensures that EFW pump performance has not degraded below the acceptance criteria during the cycle. Flow and differential head are normal indications of pump performance required by Section XI of the ASME Code (Ref. 3). Because it is undesirable to introduce cold EFW into the steam generators while they are operating, this test may be performed on a test flow path.

This test confirms OPERABILITY, trends performance, and detects incipient failures by indicating abnormal performance. Performance of inservice testing in the ASME Code, Section XI (Ref. 3), at 3 month intervals, satisfies this requirement.

SR 3.7.5.3

This SR verifies that EFW can be delivered to the appropriate steam generator in the event of any accident or transient that generates an Emergency Feedwater System initiation signal by demonstrating that each automatic valve in the flow path actuates to its correct position on an actual or simulated actuation signal. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.3 (continued)

Insert 3

controls. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. The 18 month Frequency is also acceptable based on operating experience and design reliability of the equipment.~~ This SR is modified by a Note which states that the SR is not required in MODES 3 and 4. In MODES 3 and 4, the heat removal requirements would be less, thereby providing more time for operator action to manually start the required EFW pump.

SR 3.7.5.4

This SR verifies that each EFW pump starts in the event of any accident or transient that generates an initiation signal. ~~The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power.~~ This SR is modified by a Note which states that the SR is not required in MODES 3 and 4. In MODE 3 and 4, the heat removal requirements would be less, thereby providing more time for operator action to manually start the required EFW pump.

SR 3.7.5.5

This SR ensures that the EFW System is properly aligned by verifying the flow paths to each steam generator prior to entering MODE 2 after more than 30 days in MODE 5 or 6. OPERABILITY of EFW flow paths must be demonstrated before sufficient core heat is generated that would require the operation of the EFW System during a subsequent shutdown. The Frequency is reasonable, based on engineering judgment, in view of other administrative controls to ensure that the flow paths are OPERABLE. To further ensure EFW System alignment, flow path OPERABILITY is verified, following extended outages to determine no misalignment of valves has occurred. This SR ensures that the flow path from the UST to the steam generator is properly aligned.

BASES

ACTIONS

A.1 and A.2 (continued)

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1

This SR verifies that the UST and HW contain the required volume of cooling water. ~~The 12 hour Frequency is based on operating experience and the need for operator awareness of unit evolutions that may affect the UST and HW inventory between checks. The 12 hour Frequency is considered adequate in view of other indications in the control room, including alarms to alert the operator to abnormal deviations in UST and HW levels.~~

Insert 3

REFERENCES

1. UFSAR, Section 10.4.
2. UFSAR, Chapter 10.
3. UFSAR, Chapter 15.
4. 10 CFR 50.36.

BASES

ACTIONS

C.1 and C.2 (continued)

must be placed in at least MODE 3 within 12 hours, and in MODE 5 within 60 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. The extended interval to reach MODE 5 provides additional time to restore the required LPSW pump and is reasonable considering that the potential for an accident or transient is reduced in MODE 3.

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

For Units with LPSW RB Waterhammer Prevention System installed, verifying the correct level in the leakage accumulator will provide assurance that in the event of boundary valve leakage during a LOOP event, there is sufficient water to keep the LPSW piping filled. The required water level is between half full and full, which corresponds to a level indication of 20.5" to 41". Any level glass reading is bounded by 20.5" to 41" level indication, therefore any level glass reading is considered acceptable. During LPSW testing, accumulator level > 41" is acceptable because the mass of air in the accumulator is unchanged in the short term; therefore the accumulator is still capable of performing its safety function.

Insert 3

~~The 12 hour Frequency is based on engineering judgment and considered sufficient to ensure the appropriate amount of water is available in the accumulator.~~

SR 3.7.7.2

Verifying the correct alignment for manual, and power operated valves in the LPSW System flow path provides assurance that the proper flow paths exist for LPSW System operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to locking, sealing, or securing. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.7.2 (continued)

Insert 3

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

This SR is modified by a Note indicating that the isolation of components or systems supported by the LPSW System does not affect the OPERABILITY of the LPSW System.

SR 3.7.7.3

The SR verifies proper automatic operation of the LPSW System valves. The LPSW System is a normally operating system that cannot be fully actuated as part of the normal testing. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. The 18 month Frequency is based on the need to perform this Surveillance under the conditions that apply during a unit outage and the potential for an unplanned transient if the Surveillance were performed with the reactor at power. Operating experience has shown that these components usually pass the Surveillance when performed at the 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

SR 3.7.7.4

The SR verifies proper automatic operation of the LPSW System pumps on an actual or simulated actuation signal. The LPSW System is a normally operating system that cannot be fully actuated as part of normal testing during normal operation. The 18 month Frequency is consistent with the Inservice Testing Program. Operating experience has shown that these components usually pass the Surveillance when performed at an 18 month Frequency. Therefore, the Frequency is acceptable from a reliability standpoint.

SR 3.7.7.5

For Units with LPSW RB Waterhammer Prevention System installed, the SR verifies proper operation of the LPSW RB Waterhammer Prevention System leakage accumulator. Verifying adequate flow from the accumulator will provide assurance that in the event of boundary valve leakage during a LOOP event, there is sufficient water to keep LPSW piping filled.

The 18 month Frequency is based on engineering judgment and operating experience.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.7.6

For Units with LPSW RB Waterhammer Prevention System installed, the SR verifies that LPSW WPS boundary valve leakage is ≤ 20 gpm. Verifying boundary valve leakage is within limits will ensure that in the event of a LOOP, a waterhammer will not occur, because the LPSW leakage accumulator will be able to maintain the LPSW piping water solid.

The LPSW Leakage Accumulator is designed to allow up to 25 gpm of aggregate leakage for one minute. The boundary valve leakage is limited to 20 gpm in order to allow five (5) gpm of miscellaneous leakage.

Insert 3

The 18 month Frequency is based on engineering judgment and operating experience.

REFERENCES

1. UFSAR, Section 9.2.2.
2. UFSAR, Section 6.3.
3. 10 CFR 50.36.

BASES

ACTIONS

A.1

If one required ECCW siphon header is inoperable, action must be taken to restore the inoperable ECCW siphon header to OPERABLE status within 72 hours.

In this Condition, the remaining ECCW siphon header is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE ECCW siphon header could result in loss of ECCW system function. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE ECCW siphon header, and the low probability of a accident occurring during this period.

B.1 and B.2

If the Required Action and associated Completion Time are not met, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 5 within 60 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

This SR requires verification every 12 hours that the required ESV pumps are in operation. Verification includes confirming appropriate vacuum tank pressure or pump status monitoring, which help ensure that ECCW siphon headers are maintained sufficiently primed. The 12 hour Frequency has been shown by operating practice to be sufficient to regularly assess degradation. In addition, control room indication normally indicate pump status and an alarm is provided for low vacuum tank vacuum.

Insert 3

SR 3.7.8.2

Verifying Keowee Lake level is within limit ensures ECCW siphons can provide sufficient flow to ensure adequate NPSH is available for operating the LPSW pumps. The 24 hour Frequency is based on operating experience related to the trending of the parameter variations during the applicable MODES. This SR verifies that the Keowee water level is ≥ limit specified in UFSAR Chapter 16. Lake level requirements are maintained in UFSAR Chapter 16 (Ref. 3) since the values are

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.8.2 (continued)

subject to change resulting from modifications and changes in operating practices, which may impact LPSW System flow requirements.

SR 3.7.8.3

This SR verifies that the average water temperature at the CCW inlet is ≤ 90°F. This SR verifies that CCW inlet temperature is consistent with assumptions in the safety analysis regarding inlet temperature for the LPSW system. The 24 hour Frequency is based on operating experience related to the trending of the parameter variations during the applicable MODES.

Insert 3

SR 3.7.8.4

Verifying the correct alignment for manual, and non-automatic power operated valves in the ECCW siphon header flow paths, required ESV flow paths and required SSW flow paths provides assurance that the proper flow paths exist for ECCW siphon header operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since those valves are verified to be in the correct position prior to locking, sealing, or securing. Additionally, this SR does not apply to automatic valves since these valves actuate to the correct position upon initiation. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves.

This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position.

The 31 day Frequency is based on engineering judgment, is consistent with the procedural controls governing valve operation, and ensures correct valve positions.

SR 3.7.8.5

Verification that ESV float valves open upon an actual or simulated actuation ensures a flow path is provided to the ESV pumps to assure the ECCW siphon headers are maintained sufficiently primed. The basis for the Frequency of 92 days is ~~ASME Code, Section XI (Ref. 4).~~

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.8.6

Verification that required ESV valves actuate to the correct position ensures the ESV tank minimum flow valves will automatically close during a loss of offsite power event so that the full capacity of the ESV pumps will be aligned to the ECCW siphon headers. Verification that required SSW valves actuate to the correct position ensures sufficient seal water is provided to ESV pumps. The basis for the Frequency of 92 days is ASME Code, Section XI (Ref. 4).

Insert 3

SR 3.7.8.7

Verifying that each ESV pump's capacity at the test point is greater than or equal to the required capacity ensures that pump performance has not degraded below the acceptance criteria during the cycle. ESV pump capacity is determined by measuring the "apparent" flow rate and calculating the "corrected" flow rate by adjusting for air density changes between the measurement point and the pump inlet. The vacuum level must be within a prescribed range during this measurement to ensure that the flowmeter is on-scale and the pump operating liquid is not cavitating. Note that the pump is a constant volume machine. Thus, there is not a single test point but a range of acceptable vacuum levels. Although ASME code for inservice testing does not specifically address vacuum pumps, manufacturers test methods coupled with the ASME standard (OM-6) (Ref. 5) requirements for testing methodology are used as a guide for testing. Accordingly, the basis for the Frequency of 92 days is ASME Code, Section XI (Ref. 4). 4

SR 3.7.8.8

Verification that each required ESV pump automatically starts within 1200 seconds after an actual or simulated restoration of emergency power assures required ESV pumps will function after a loss of offsite power to maintain ECCW siphon headers sufficiently primed to maintain necessary flow to the suction of LPSW pumps. The Frequency of 92 days is based on engineering judgement.

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.8.9

This SR verifies the ECCW system functions to supply siphon header flow to the suction of the LPSW pumps during design basis conditions by ensuring air accumulation in the ECCW siphon headers is within the removal capabilities of the ESV System. This SR establishes siphon flow with the ESV pumps off. Air accumulation in the pipe results in a corresponding reduction in water level in the CCW piping over a time period. The rate of water level reduction is recorded and compared to limits established in design basis documents. The limits on the rate of water level reduction over a time period are established to ensure ECCW siphon header air accumulation rate is within the removal capabilities of the ESV System under design basis conditions. ~~The Frequency of 18 months is based on the need to perform this SR when the Unit is shutdown.~~ This SR is not required to be performed with the Unit 3 LPSW System taking suction from the siphon. This is acceptable since aligning the LPSW pumps to the Unit 3 ECCW siphon headers is not necessary to demonstrate that the ECCW air accumulation is within the ESV capacity which is the basic purpose of the test. The flow path from the Unit 3 CCW piping to the suction of the Unit 3 LPSW pumps is demonstrated by normal operation of the LPSW pumps.

Insert 3

A Note states that for Units 1 and 2, the SR is not required to be performed with the shared LPSW System for Units 1 and 2 taking suction from the siphon. This is necessary to avoid potential effects on an operating unit and is acceptable since the capability of the LPSW pumps to take suction from the CCW crossover header is demonstrated by normal, day-to-day operation of the LPSW pumps. Although a loss of suction to the LPSW pumps is unlikely during this SR, it is prudent to minimize the potential for jeopardizing the LPSW suction supply to the LPSW pumps when they are supporting an operating Unit.

REFERENCES

1. UFSAR, Chapter 9.
2. 10 CFR 50.36.
3. UFSAR, Chapter 16.
4. ~~ASME, Boiler and Pressure Vessel Code, Section XI.~~
5. ASME Standard OM-6.

Amendment Nos.

BASES

ACTIONS (continued)

E.1

During movement of recently irradiated fuel assemblies, when one or more CRVS trains are inoperable, action must be taken immediately to suspend activities that could release radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.9.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not severe, testing each train once every 92 days adequately checks this system. The trains need only be operated for ≥ one hour and all dampers verified to be OPERABLE to demonstrate the function of the system. This test includes an external visual inspection of the CRVS Booster Fan trains. The 92 day Frequency is based on the known reliability of the equipment.

Insert 3

SR 3.7.9.2

This SR verifies that the required CRVS Booster Fan train testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CRVS Booster Fan train filter test frequencies are in accordance with Regulatory Guide 1.52 (Ref. 4). The VFTP includes testing HEPA filter performance and carbon adsorber efficiency. Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.9.3

This SR verifies the integrity of the Control Room enclosure. The Control Room positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify that the CRVS Booster Fan trains are functioning properly. During the emergency mode of operation, the CRVS Booster Fan trains are designed to pressurize the Control Room to minimize unfiltered inleakage. The CRVS Booster Fan trains are designed to maintain this positive pressure with both trains in operation. The Frequency of 18 months is consistent with industry practice.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

This SR verifies that sufficient Spent Fuel Pool water is available in the event of a fuel handling or cask drop accident. The water level in the Spent Fuel Pool must be checked periodically. ~~The 7 day Frequency is appropriate because the volume in the pool is normally stable. Water level changes are controlled by unit procedures and are acceptable, based on operating experience.~~

Insert 3

During refueling operations, the level in the Spent Fuel Pool is at equilibrium with that in the fuel transfer canal, and the level in the fuel transfer canal is checked ~~daily~~ in accordance with SR 3.9.6.1.

REFERENCES

1. UFSAR, Section 9.1.2.
2. UFSAR, Section 9.1.3.
3. UFSAR, Section 15.11.2.
4. Regulatory Guide 1.183, July 2000.
5. WCAP-7828, December 1971.
6. 10 CFR 50.36

Amendment Nos.

BASES

ACTIONS

A.1 and A.2 (continued)

If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operation. Therefore, inability to suspend movement of fuel assemblies is not a sufficient reason to require a reactor shutdown.

When the concentration of boron in the SFP is less than required, immediate action must be taken to preclude the occurrence of an accident or to mitigate the consequences of an accident in progress. This is achieved by immediately suspending the movement of the fuel assemblies. This does not preclude movement of a fuel assembly to a safe position. Immediate action is also required to initiate action to restore the SFP boron concentration to within limits.

SURVEILLANCE REQUIREMENTS

SR 3.7.12.1

This SR verifies that the concentration of boron in the SFP is within the required limit. As long as this SR is met, the analyzed incidents are fully addressed. The 7 day Frequency is appropriate because no major replenishment of pool water is expected to take place over a short period of time. The COLR revision process assures that the minimum boron concentration specified in the COLR bounds the limit specified by this SR.

Insert 3

REFERENCES

1. 10 CFR 50.68(b).

2. American Nuclear Society, "American National Standard Design Requirements for Light Water Reactor Fuel Storage Facilities at Nuclear Power Plants," ANSI/ANS-57.2-1983, October 7, 1983.

3. Nuclear Regulatory Commission, Memorandum to Timothy Collins from Laurence Kopp, "Guidance on the Regulatory Requirements for Criticality Analysis of Fuel Storage at Light Water Reactor Power Plants," August 19, 1998.

4. Double contingency principle of ANSI N16.1-1975, as specified in the April 14, 1978 NRC letter (Section 1.2) and implied in the proposed revision to Regulatory Guide 1.13 (Section 1.4, Appendix A).

BASES (continued)

LCO

As indicated in the Applicable Safety Analyses, the specific activity limit in the secondary coolant system of ≤ 0.10 μCi/gm DOSE EQUIVALENT I-131 maintains the radiological consequences of an accident to within Reference 1 limits.

Monitoring the specific activity of the secondary coolant ensures that, when secondary specific activity limits are exceeded, appropriate actions are taken, in a timely manner, to place the unit in an operational MODE that would minimize the radiological consequences of an accident.

APPLICABILITY

In MODES 1, 2, 3, and 4, the limits on secondary specific activity apply due to the potential for secondary steam releases to the atmosphere.

In MODES 5 and 6, the steam generators are not being used for heat removal. Both the RCS and steam generators are at low pressure and primary to secondary LEAKAGE is minimal. Therefore, secondary specific activity is not a concern.

ACTIONS

A.1 and A.2

DOSE EQUIVALENT I-131 exceeding the allowable value in the secondary coolant contributes to increased post accident doses. If secondary specific activity cannot be restored to within limits within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.14.1

This SR verifies that the secondary specific activity is within the limits of the accident analysis assumptions. A gamma isotopic analysis of the secondary coolant, which determines DOSE EQUIVALENT I-131, confirms the assumptions of Reference 1 are met. It also serves to identify and trend any unusual isotopic concentrations that might indicate changes in reactor coolant activity or LEAKAGE. The 31 day Frequency is based on the detection of increasing trends of the level of DOSE EQUIVALENT I-131, and allows for appropriate action to be taken to maintain levels below the LCO limit.

Insert 3

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.16.1

This SR verifies that the heat removal capability of the system is sufficient to maintain the temperature in the control room and cable room at or below 80°F and maintain the temperature in the electrical equipment room at or below 85°F. The temperature is determined by reading gauges in each area or computer points which are considered representative of the average area temperature. These temperature limits are based on operating history and are intended to provide an indication of degradation of the cooling systems. The limits are conservative with respect to equipment operability temperature limits. The values for the SR are values at which the system is removing sufficient heat to meet design requirements (i.e., OPERABLE) and sufficiently above the values associated with normal operation during hot weather. The temperature in the equipment room is typically slightly higher than the temperature in the control room or cable room. Because of that, a higher value is specified for this area. The 12 hour Frequency is appropriate since significant degradation of the CRACS is slow and is not expected over this time period.

Insert 3

REFERENCES

1. UFSAR, Section 3.11.5.
2. UFSAR, Section 9.4.1.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.1 (continued)

connected to their power source, and that appropriate separation of offsite sources is maintained. The 7 day Frequency is adequate since breaker position is not likely to change without the operator being aware of it and because its status is displayed in the control room.

Insert 3

SR 3.8.1.2

This SR verifies adequate battery voltage when the KHU batteries are on float charge. This SR is performed to verify KHU battery OPERABILITY. The Frequency of once per 7 days is consistent with manufacturers recommendations and IEEE-450 (Ref. 8).

SR 3.8.1.3

This SR verifies the availability of the KHU associated with the underground emergency power path to start automatically and energize the underground power path. Utilization of either the auto-start or emergency start sequence assures the control function OPERABILITY by verifying proper speed control and voltage. Power path verification is included to demonstrate breaker OPERABILITY from the KHU onto the standby buses. This is accomplished by closing the Keowee Feeder Breakers (SK) to energize each deenergized standby bus. The 31 day Frequency is adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

SR 3.8.1.4

This surveillance verifies the availability of the KHU associated with the overhead emergency power path. Utilization of either the auto-start or emergency start sequence assures the control function OPERABILITY by verifying proper speed control and voltage. The ability to supply the overhead emergency power path is satisfied by demonstrating the ability to synchronize (automatically or manually) the KHU with the grid system. If an automatic start of the KHU is performed and a manual synchronization is desired, the KHU will need to be shutdown and re-started in manual to allow a manual synchronization of the KHU. The SR also requires that the underground power path be energized after removing the KHU from the overhead emergency power path. This surveillance can be satisfied by first demonstrating the ability of the KHU associated with the underground emergency path to energize the underground path then synchronizing the KHU to the overhead

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.4 (continued)

emergency power path. The SR is modified by a Note indicating that the requirement to energize the underground emergency power path is not applicable when the overhead disconnects are open for the KHU associated with the underground emergency power path or 2) when complying with Required Action D.1. The latter exception is necessary since Required Action D.1 continues to be applicable when both KHUs are inoperable.

Insert 3

~~The 31 day Frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.~~

SR 3.8.1.5

This surveillance verifies OPERABILITY of the trip functions of each closed SL and each closed N breaker. Neither of these breakers have any automatic close functions; therefore, only the trip coils require verification. Cycling of each breaker demonstrates functional OPERABILITY and the coil monitor circuits verify the integrity of each trip coil. ~~The 31 day frequency is based on operating experience.~~

This SR modified by a Note that states it is not required to be performed for an SL breaker when its standby bus is energized from a LCT via an isolated power path. This is necessary since the standby buses are required to be energized from a LCT by several Required Actions of Specification 3.8.1 and the breakers must remain closed to energize the standby buses from a LCT.

SR 3.8.1.6

Infrequently used source breakers are cycled to ensure OPERABILITY. The Standby breakers are to be cycled one breaker at a time to prevent inadvertent interconnection of two units through the standby bus breakers. Cycling the startup breakers verifies OPERABILITY of the breakers and associated interlock circuitry between the normal and startup breakers. This circuitry provides an automatic, smooth, and safe transfer of auxiliaries in both directions between sources. ~~The 31 day Frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.~~

This SR is modified by a Note which states the SR is not required to be

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.6 (continued)

performed for an S breaker when its standby bus is energized from a LCT via an isolated power path. This is necessary since the standby buses are required to be energized from a LCT by several Required Actions of Specification 3.8.1 and cycling the S breakers connects the standby buses with the main feeder buses which are energized from another source.

SR 3.8.1.7

The KHU tie breakers to the underground path, ACB3 and ACB4, are interlocked to prevent cross-connection of the KHU generators. The safety analysis utilizes two independent power paths for accommodating single failures in applicable accidents. Connection of both generators to the underground path compromises the redundancy of the emergency power paths. Installed test logic is used to verify a circuit to the close coil on one underground ACB does not exist with the other underground ACB closed. ~~The 12 month Frequency for this surveillance is adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.~~

Insert 3

SR 3.8.1.8

Each KHU tie breaker to the underground emergency power path and tie breaker to the overhead emergency path, are interlocked to prevent the unit associated with the underground circuit from automatically connecting to the overhead emergency power path. The safety analysis utilizes two independent power paths for accommodating single failures in applicable accidents. Connection of both generators to the overhead emergency power path compromises the redundancy of the emergency power paths. Temporary test instrumentation is used to verify a circuit to the close coil on the overhead ACB does not exist with the Underground ACB closed. ~~The 12 month Frequency for this Surveillance was determined to be adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.~~

SR 3.8.1.9

This surveillance verifies the KHUs' response time to an Emergency Start signal (normally performed using a pushbutton in the control room) to ensure ES equipment will have adequate power for accident mitigation. UFSAR Section 6.3.3.3 (Ref. 9) establishes the 23 second time

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.9 (continued)

requirement for each KHU to achieve rated frequency and voltage. Since the only available loads of adequate magnitude for simulating a accident is the grid, subsequent loading on the grid is required to verify the KHU's ability to assume rapid loading under accident conditions. Sequential block loads are not available to fully test this feature. This is the reason for the requirement to load the KHUs at the maximum practical rate. The 12 month Frequency for this SR is adequate based on operating experience to provide reliability verification without excessive equipment cycling for testing.

Insert 3

SR 3.8.1.10

A battery service test is a special test of the battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency of 12 months is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 6) and Regulatory Guide 1.129 (Ref. 7), which state that the battery service test should be performed with intervals between tests not to exceed 18 months.

SR 3.8.1.11

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The 12 month Frequency for this SR is consistent with manufacturers recommendations and IEEE-450 (Ref. 8), which recommends detailed visual inspection of cell condition and rack integrity on a yearly basis.

SR 3.8.1.12

Verification of cell to cell connection cleanliness, tightness, and proper coating with anti-corrosion grease provides an indication of any abnormal condition, and assures continued OPERABILITY of the battery. The 12 month frequency is based on engineering judgement and operational experience and is sufficient to detect cell connection degradation when it is properly coupled with other surveillances more frequently performed to detect abnormalities.

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.13

Insert 3

The KHU underground ACBs have a control feature which will automatically close the KHU, that is pre-selected to the overhead path, into the underground path upon an electrical fault in the zone overlap region of the protective relaying. This circuitry prevents an electrical fault in the zone overlap region of the protective relaying from locking out both emergency power paths during dual KHU grid generation. In order to ensure this circuitry is OPERABLE, an electrical fault is simulated in the zone overlap region and the associated underground ACBs are verified to operate correctly. This surveillance is required on a 12 month Frequency. The 12 month Frequency is based on engineering judgement and provides reasonable assurance that the zone overlap protection circuitry is operating properly.

This SR is modified by a Note indicating the SR is only applicable when the overhead disconnects to the underground KHU are closed. When the overhead disconnects to the underground KHU are open, the circuitry preventing the zone overlap protective lockout of both KHUs is not needed.

SR 3.8.1.14

This surveillance verifies OPERABILITY of the trip functions of the SL and N breakers. This SR verifies each trip circuit of each breaker independently opens each breaker. Neither of these breakers have any automatic close functions; therefore, only the trip circuits require verification. The 18 month Frequency is based on engineering judgement and provides reasonable assurance that the SL and N breakers will trip when required.

The SR is modified by a Note indicating that the SR is not required for an SL breaker when its standby bus is energized by a LCT via an isolated power path. This is necessary since the standby buses are required to be energized from a LCT by several Required Actions of Specification 3.8.1 and the breakers must remain closed to energize the standby buses from a LCT.

SR 3.8.1.15

This surveillance verifies proper operation of the 230 kV switchyard circuit breakers upon an actual or simulated actuation of the Switchyard Isolation circuitry. This test causes an actual switchyard isolation (by

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.15 (continued)

Insert 3

actuation of degraded grid voltage protection) and alignment of KHUs to the overhead and underground emergency power paths. ~~An 18 month Frequency minimizes the impact to the Station and the operating Units which are connected to the 230 kV switchyard.~~ The effect of this SR is not significant because the generator red bus tie breakers and feeders from the Oconee 230 kV switchyard red bus to the system grid remain closed. Either Switchyard Isolation Channel causes full system realignment, which involves a complete switchyard realignment. To avoid excessive switchyard circuit breaker cycling, realignment and KHU emergency start functions, this SR need be performed only once each SR interval.

This SR is modified by a Note. This Note states the redundant breaker trip coils shall be verified on a STAGGERED TEST BASIS. Verifying the trip coils on a STAGGERED TEST BASIS precludes unnecessary breaker operation and minimizes the impact to the Station and the operating Units which are connected to the 230 kV switchyard.

SR 3.8.1.16

This SR verifies by administrative means that one KHU provides an alternate manual AC power source capability by manual or automatic KHU start with manual synchronize, or breaker closure, to energize its non-required emergency power path. That is, when the KHU to the overhead emergency power path is inoperable, the SR verifies by administrative means that the overhead emergency power path is OPERABLE. When the overhead emergency power path is inoperable, the SR verifies by administrative means that the KHU associated with the overhead emergency power path is OPERABLE.

This SR is modified by a Note indicating that the SR is only applicable when complying with Required Action C.2.2.4.

SR 3.8.1.17

This SR verifies the Keowee Voltage and Frequency out of tolerance logic trips and blocks closure of the appropriate overhead or underground power path breakers on an out of tolerance trip signal. The 18 month Frequency is based on engineering judgement and provides reasonable assurance that the Voltage and Frequency out of tolerance logic trips and blocks closure of these breakers when required.

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1 (continued)

Insert 3

proper voltage availability on the distribution centers ensures that the required voltage is readily available for isolating transfer diodes connected to these distribution centers. ~~The 7 day Frequency takes into account the redundant capability of the DC electrical power distribution systems, and other indications available in the control room that alert the operator to system malfunctions.~~

SR 3.8.3.2

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the charging system and the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery (or battery cell) and maintain the battery (or a battery cell) in a fully charged state. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the initial voltages assumed in the battery sizing calculations. ~~The 7 day Frequency is consistent with manufacturer recommendations and IEEE-450 (Ref. 5).~~

SR 3.8.3.3

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The presence of physical damage or deterioration does not necessarily represent a failure of this SR, provided an evaluation determines that the physical damage or deterioration does not affect the OPERABILITY of the battery (its ability to perform its design function).

~~The 12 month Frequency for this SR is consistent with IEEE-450 (Ref. 5), which recommends detailed visual inspection of cell condition and rack integrity on a yearly basis.~~

SR 3.8.3.4

Visual inspection of inter-cell, inter-rack, inter-tier, and terminal connections provide an indication of physical damage or abnormal deterioration that could indicate degraded battery condition. The

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.4 (continued)

anticorrosion material is used to help ensure good electrical connections and to reduce terminal deterioration. The visual inspection for corrosion is not intended to require removal of and inspection under each terminal connection.

Insert 3

The Surveillance Frequencies of 12 months are consistent with IEEE-450 (Ref. 5), which recommends cell to cell and terminal connection visual inspection on a yearly basis.

SR 3.8.3.5

A battery service test is a special test of the battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency of 12 months is consistent with the recommendations of Regulatory Guide 1.32 (Ref. 6) and Regulatory Guide 1.129 (Ref. 7), which state that the battery service test should be performed during refueling operations, or at some other outage, with intervals between tests not to exceed 18 months.

SR 3.8.3.6

This SR requires battery capacity be verified in accordance with the Battery Discharge Testing Program. A battery performance discharge test is a test of constant current capacity of a battery, normally done in the as found condition, after having been in service, to detect any change in the capacity determined by the acceptance test.

The test is intended to determine overall battery degradation due to age and usage.

The Surveillance Frequencies for this test are in accordance with the Battery Discharge Testing Program and are consistent with the recommendations in IEEE-450 (Ref. 5). These periodic frequencies are based on the outcome of the previous battery capacity test.

Amendment Nos.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.5.1

This SR verifies that Category A battery cell parameters are consistent with IEEE-450 (Ref. 4), which recommends regular battery inspections including voltage, specific gravity, and electrolyte temperature of pilot cells.

Insert 3

SR 3.8.5.2

periodic

The ~~quarterly~~ inspection of specific gravity and voltage is ~~consistent with IEEE-450 (Ref. 4).~~

based on operating experience, equipment reliability and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.5.3

This Surveillance verification that the average temperature of representative cells is ≥ 60°F is ~~consistent with a recommendation of IEEE-450 (Ref. 4), which states that the temperature of electrolytes in representative cells should be determined on a quarterly basis.~~

Lower than normal temperatures act to inhibit or reduce battery capacity. This SR ensures that the operating temperatures remain within an acceptable operating range. This limit is based on plant specific calculations.

Table 3.8.5-1

This table delineates the limits on electrolyte level, float voltage, and specific gravity for three different categories. The meaning of each category is discussed below.

Category A defines the normal parameter limit for each designated pilot cell in each battery. The cells selected as pilot cells are those whose temperature, voltage and electrolyte specific gravity are considered to approximate the state of charge of the entire battery.

The Category A limits specified for electrolyte level are based on manufacturer recommendations and are consistent with the guidance in IEEE-450 (Ref. 4), with the extra ¼ inch allowance above the high water level indication for operating margin to account for temperatures and charge effects. In addition to this allowance, footnote a to Table 3.8.5-1 permits the electrolyte level to be above the specified maximum level during equalizing charge, provided it is not overflowing. These limits

BASES

ACTIONS

A.1 (continued)

based upon engineering judgment, taking into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. This has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems such a shutdown might entail. When the 120 VAC Vital Instrumentation panelboard is powered from its regulated voltage source, it is relying upon interruptible AC electrical power sources (offsite and onsite). The uninterruptible inverter source to the 120 VAC Vital Instrumentation panelboards is the preferred source for powering instrumentation trip setpoint devices.

Required Action A.1 is also modified by Note 2 which indicates that the Completion Time is reduced when in Condition L of LCO 3.8.1. Condition L limits the Completion Time for restoring an inoperable vital inverter to 4 hours when emergency power source(s) or offsite power source(s) are inoperable for extended time periods or for specific reasons.

B.1 and B.2

If the Required Action and associated Completion Time are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and 120 VAC Vital Instrumentation panelboards energized from the inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation of the RPS and ES connected to the 120 VAC Vital Instrumentation panelboards. The 7 day Frequency takes into account the redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.

Insert 3

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2.4 (continued)

the associated inverter(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCOs' Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend ~~CORE ALTERATIONS,~~ movement of recently irradiated fuel assemblies, and operations involving positive reactivity additions).

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required inverters and to continue this action until restoration is accomplished in order to provide the necessary inverter power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required inverters should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power or powered from an alternate regulated voltage source.

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and 120 VAC Vital Instrumentation panelboards energized from the inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation connected to the 120 VAC Vital Instrumentation panelboards. The 7 day Frequency takes into account the redundant capability of the inverters and other indications available in the control room that alert the operator to inverter malfunctions.

Insert 3

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. 10 CFR 50.36.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the main feeder buses are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence is maintained, and the appropriate voltage is available to each required bus. The verification of proper voltage availability on the buses ensures that the required voltage is readily available for motive as well as control functions for critical system loads connected to these buses. The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC vital electrical power distribution systems, and other indications available in the control room that alert the operator to system malfunctions.

SR 3.8.8.2

This Surveillance verifies that the required AC, DC, and AC vital electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence is maintained, and the appropriate voltage is available to each ES power string and panelboard. The verification of voltage availability on the ES power strings, and panelboards ensures that voltage is readily available for motive as well as control functions for critical system loads connected to the ES power strings, and panelboards. Verification of voltage availability may be accomplished by observing alarm conditions, status lights or by confirming proper operation of a component supplied from each ES power string or panelboard. The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC vital electrical power distribution systems, and other indications available in the control room that alert the operator to system malfunctions.

Insert 3

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. Regulatory Guide 1.93, December 1974.
4. 10 CFR 50.36.

Amendment Nos

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

This Surveillance verifies that the required main feeder buses are functioning properly, with all the required main feeder buses energized. The verification of proper voltage availability on the buses, ES power strings and panelboards ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. The 7 day Frequency takes into account the capability of the electrical power distribution buses, ES power strings and panelboards, and other indications available in the control room that alert the operator to system malfunctions.

SR 3.8.9.2

This Surveillance verifies that the required AC, DC, and AC vital electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence is maintained, and the appropriate voltage is available to each ES power strings and panelboards. The verification of voltage availability on the ES power strings, and panelboards ensures that voltage is readily available for motive as well as control functions for critical system loads connected to the ES power strings, and panelboards. Verification of voltage availability may be accomplished by observing alarm conditions, status lights or by confirming proper operation of a component supplied from each ES power string or panelboard. The 7 day Frequency takes into account the redundant capability of the AC, DC, and AC vital electrical power distribution systems, and other indications available in the control room that alert the operator to system malfunctions.

Insert 3

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 14.
3. 10 CFR 50.36.

Amendment Nos.

BASES

ACTIONS

A.1 and A.2 (continued)

Suspension of CORE ALTERATIONS and positive reactivity additions shall not preclude moving a component to a safe position.

A.3

In addition to immediately suspending CORE ALTERATIONS and positive reactivity additions, action to restore the concentration must be initiated immediately.

One means of complying with the action is to initiate boration of the affected volume. In determining the required combination of boration flow rate and concentration, there is no unique Design Basis Event that must be satisfied. The only requirement is to restore the boron concentration to its required value as soon as possible. In order to raise the boron concentration as soon as possible, the operator should begin boration with the best source available for unit conditions.

Once actions have been initiated, they must be continued until the boron concentration is restored. The restoration time depends on the amount of boron that must be injected to reach the required concentration.

SURVEILLANCE REQUIREMENTS

SR 3.9.1.1

This SR ensures the coolant boron concentration in the RCS and the refueling canal is within the COLR limits. The boron concentration of the coolant in each volume is determined ~~every 72 hours~~ by chemical analysis.

Insert 3

~~The Frequency is based on industry experience, which has shown 72 hours to be adequate.~~

REFERENCES

1. UFSAR, Section 3.1

2. 10 CFR 50.36.

BASES

ACTIONS

B.2 (continued)

made in accordance with Required Actions A.1 and A.2, the core reactivity condition is stabilized until the source range neutron flux monitors are restored to OPERABLE status. This stabilized condition is verified by performing SR 3.9.1.1 to ensure that the required boron concentration exists.

The Completion Time of 4 hours is sufficient to obtain and analyze a reactor coolant sample for boron concentration. The Frequency of once per 12 hours ensures that unplanned changes in boron concentration would be identified. The 12 hour Frequency is reasonable, considering the low probability of a change in core reactivity during this time period.

SURVEILLANCE REQUIREMENTS

SR 3.9.2.1

SR 3.9.2.1 is the performance of a CHANNEL CHECK, which is a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that the indication channel(s) should be consistent with core conditions. Changes in fuel loading and core geometry can result in significant differences between source range channels, but each channel should be consistent with its local conditions. When in MODE 6 with one channel OPERABLE, a CHANNEL CHECK is still required. However, in this condition, a redundant source range instrument may not be available for comparison. The CHANNEL CHECK provides verification that the OPERABLE source range channel is energized and indicates a value consistent with current unit status.

Insert 3

The Frequency of 12 hours is consistent with the CHANNEL CHECK Frequency specified similarly for the same instruments in LCO 3.3.9.

SR 3.9.2.2

SR 3.9.2.2 is the performance of a CHANNEL CALIBRATION every 18 months. This SR is modified by a Note stating that neutron detectors are excluded from the CHANNEL CALIBRATION. The CHANNEL CALIBRATION for the source range nuclear instrument is a complete check and re-adjustment of the channel, from the pre-amplifier input to the indicator. The 18 month Frequency is based on the need to perform this Surveillance during the conditions that apply during a unit outage. Industry experience has shown these components usually pass the Surveillance when performed at the 18 month Frequency.

Amendment Nos.

BASES (continued)

APPLICABILITY (continued)

without containment closure capability. Therefore, under these conditions no requirements are placed on containment penetration status.

ACTIONS

A.1

With the containment equipment hatch, air locks, or any containment penetration that provides direct access from the containment atmosphere to the outside atmosphere not in the required status, including the Containment Purge and Exhaust Isolation System not capable of automatic actuation when the purge and exhaust valves are open, the unit must be placed in a condition in which the isolation function is not needed. This is accomplished by immediately suspending movement of recently irradiated fuel assemblies within containment. Performance of these actions shall not preclude moving a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

This Surveillance demonstrates that each of the containment penetrations required to be in its closed position is in that position. Also the Surveillance will demonstrate that each open penetration's valve operator has motive power, which will ensure each valve is capable of being closed.

Insert 3

The Surveillance is performed every 7 days during the movement of recently irradiated fuel assemblies within the containment. The Surveillance interval is selected to be commensurate with the normal duration of time to complete fuel handling operations.

As such, this Surveillance ensures that a postulated fuel handling accident involving handling recently irradiated fuel that releases fission product radioactivity within the containment will not result in a release of significant fission product radioactivity to the environment.

SR 3.9.3.2

This Surveillance demonstrates that each containment purge supply and exhaust isolation valve that is not locked, sealed or otherwise secured in the isolation position actuates to its isolation position on an actual or simulated high radiation signal. The frequency requires the isolation capability of the reactor building purge valves to be verified functional once each refueling outage prior to movement of recently irradiated fuel assemblies within containment. This ensures that this function is

BASES

ACTIONS (continued)

A.3

If DHR loop requirements are not met, actions shall be initiated immediately in order to satisfy DHR loop requirements.

Restoration of one decay heat removal loop is required because this is the only active method of removing decay heat. Dissipation of decay heat through natural convection should not be relied upon for an extended period of time. Reliance on natural convection can lead to boiling which results in inventory loss. Sustained inventory loss can eventually result in inadequate decay heat removal from the core with subsequent release of fission products from the core to the reactor building atmosphere. The immediate Completion Time reflects the importance of restoring an adequate heat cooling loop.

A.4

If DHR loop requirements are not met, all containment penetrations providing direct access from the containment atmosphere to outside atmosphere shall be closed within 4 hours.

If no means of decay heat removal can be restored, the core decay heat could raise temperatures and cause boiling in the core which could result in uncovering the core and the release of radioactivity to the reactor building atmosphere. Closure of penetrations providing access to the outside atmosphere will prevent uncontrolled release of radioactivity to the environment.

SURVEILLANCE REQUIREMENTS

SR 3.9.4.1

This Surveillance demonstrates that the DHR loop is in operation and circulating reactor coolant. Verification includes flow rate, temperature, or pump status monitoring, which help assure that forced flow is providing heat removal. ~~The Frequency of 12 hours is sufficient, considering the flow, temperature, pump control, and alarm indications available to the operator in the control room for monitoring the DHR System.~~

Insert 3

REFERENCES

1. 10 CFR 50.36.

Amendment Nos.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1

This Surveillance demonstrates that one DHR loop is in operation. The flow rate is determined by the operator as that necessary to provide adequate decay heat removal capability.

Insert 3

The Frequency of 12 hours is sufficient, considering the flow, temperature, pump control, and alarm indications available to the operator to monitor the DHR Loops in the control room.

SR 3.9.5.2

Verification that each required pump is OPERABLE ensures that an additional DHR pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pump. The Frequency of 7 days is considered reasonable in view of other administrative controls available and has been shown to be acceptable by operating experience.

REFERENCES

1. 10 CFR 50.36.

BASES (continued)

APPLICABLE SAFETY ANALYSES (continued)

accident is adequately captured by the water, and offsite doses are maintained within allowable limits (Ref. 3).

Fuel Transfer Canal water level satisfies Criterion 2 of 10 CFR 50.36

LCO

A minimum fuel transfer canal water level of 21.34 ft above the reactor vessel flange is required to ensure that the radiological consequences of a postulated fuel handling accident inside containment are within acceptable limits as provided by 10 CFR 50.67.

APPLICABILITY

LCO 3.9.6 is applicable when moving irradiated fuel assemblies within the containment. The LCO minimizes the possibility of a fuel handling accident in containment that is beyond the assumptions of the safety analysis. If irradiated fuel is not present in containment, there can be no significant radioactivity release as a result of a postulated fuel handling accident. Requirements for fuel handling accidents in the spent fuel pool are covered by LCO 3.7.11, "Fuel Storage Pool Water Level."

ACTIONS

A.1

With a water level of < 21.34 ft above the top of the reactor vessel flange, all operations involving movement of irradiated fuel assemblies shall be suspended immediately to ensure that a fuel handling accident cannot occur.

The suspension of fuel movement shall not preclude completion of movement of a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.6.1

Verification of a minimum water level of 21.34 ft above the top of the reactor vessel flange ensures that the design basis for the postulated fuel handling accident analysis during refueling operations is met. Water at the required level above the top of the reactor vessel flange limits the consequences of damaged fuel rods that are postulated to result from a postulated fuel handling accident inside containment (Ref. 2).

Insert 3

The Frequency of 24 hours is based on engineering judgment and is considered adequate in view of the large volume of water and the normal procedural controls of valve positions, which make significant unplanned level changes unlikely.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.7.1

These valves are to be secured closed to isolate possible dilution paths. The likelihood of a significant reduction in the boron concentration during MODE 6 operations is remote due to the large mass of borated water in the fuel transfer canal and the fact that all unborated water sources are isolated, precluding a dilution. The boron concentration is checked ~~every 72 hours~~ during MODE 6 under SR 3.9.1.1. This Surveillance demonstrates that the valves are closed through a system walkdown. The 31 day Frequency is based on engineering judgment and is considered reasonable in view of other administrative controls that will ensure that the valve opening is an unlikely possibility.

Insert 3

REFERENCES

1. UFSAR, Section 15.4.1.
2. 10 CFR 50.36.

BASES

ACTIONS

F.1 (continued)

year. This includes the 7 day Completion Time that leads to entry into Condition F. For example, if the SSF ASW System is inoperable for 10 days, the 45 day special inoperability period is reduced to 35 days. If the SSF ASW System is inoperable for 6 days, Condition A applies and there is no reduction in the 45 day allowance. The limit of 45 days per calendar year minimizes the number and duration of extended outages associated with exceeding the 7 day Completion Time of a Condition.

G.1 and G.2

If the Required Action and associated Completion Time of Condition F are not met or if the Required Action and associated Completion Time of Condition A, B, C, D, or E are not met for reasons other than Condition F, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours and MODE 4 within 84 hours. The allowed Completion Times are appropriate, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems, considering a three unit shutdown may be required.

SURVEILLANCE REQUIREMENTS

SR 3.10.1.1

Performance of the CHANNEL CHECK once every 7 days for each required instrumentation channel ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel with a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION. This SR is modified by a Note to indicate that it is not applicable to the SSF RCS temperature instrument channels, which are common to the RPS RCS temperature instrument channels and are normally aligned through a transfer isolation device to each Unit control room. The instrument string to the SSF control room is checked and calibrated every 18 months.

periodically per the Surveillance Frequency Control Program.

Agreement criteria are determined based on a combination of the channel instrument uncertainties, including indication and readability. If a

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.10.1.1 (continued)

channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Off scale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

Insert 3

The Frequency is based on unit operating experience that demonstrates channel failure is rare.

SR 3.10.1.2

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the charging system and the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery (or battery cell) and maintain the battery (or a battery cell) in a fully charged state. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the initial voltages assumed in the battery sizing calculations. The 7 day Frequency is consistent with manufacturer recommendations and IEEE-450 (Ref. 4).

SR 3.10.1.3 and 3.10.1.4

SR 3.10.1.3 provides verification that the level of fuel oil in the day tank is at or above the level at which fuel oil is automatically added. The level is expressed as an equivalent volume in gallons. The day tank is sized based on the amount of fuel oil required to successfully start the DG and to allow for orderly shutdown of the DG upon loss of fuel oil from the main storage tank.

SR 3.10.1.4 provides verification that there is an adequate inventory of fuel oil in the storage tanks to support SSF DG operation for 72 hours at full load. The 72 hour period is sufficient time to place the unit in a safe shutdown condition

The 31 day Frequency for these SRs is adequate to assure that a sufficient supply of fuel oil is available, since low level alarms are provided and unit operators would be aware of any large uses of fuel oil during this period.

Amendment Nos.

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.5

The SR requires the DG to start (normal or emergency) from standby conditions and achieve required voltage and frequency. Standby conditions for a DG means that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations. This SR is modified by a Note to indicate that all DG starts for this Surveillance may be preceded by an engine prelube period and followed by a warmup period prior to loading. This minimizes wear on moving parts that do not get lubricated when the engine is running.

Insert 3

~~The 31 day Frequency is consistent with Regulatory Guide 1.9 (Ref. 5). This Frequency provides adequate assurance of DG OPERABILITY, while minimizing degradation resulting from testing.~~

SR 3.10.1.6

This Surveillance ensures that sufficient air start capacity for the SSF DG is available, without the aid of the refill compressor. The SSF DG air start system is equipped with four air storage tanks. Each set of two tanks will provide sufficient air to start the SSF DG a minimum of three successive times without recharging. The pressure specified in this SR is intended to reflect the lowest value at which the three starts can be accomplished.

~~The 31 day Frequency takes into account the capacity, capability, redundancy, and diversity of the AC sources.~~

SR 3.10.1.7

This Surveillance demonstrates that the fuel oil transfer pump automatically starts and transfers fuel oil from the underground fuel oil storage tank to the day tank. This is required to support continuous operation of SSF DG. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for automatic fuel transfer systems are OPERABLE.

~~The 92 day Frequency is considered acceptable based on operating experience.~~

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.8

A sample of fuel oil is required to be obtained from the SSF day tank and underground fuel oil storage tank in accordance with the Diesel Fuel Oil Testing Program in order to ensure that fuel oil viscosity, water, and sediment are within the limits of the Diesel Fuel Oil Testing Program.

Insert 3

~~The 92 day Frequency is considered acceptable based on operating experience related to diesel fuel oil quality.~~

SR 3.10.1.9

This Surveillance verifies that the SSF DG is capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize electrical loads, while minimizing the time that the DG is connected to the offsite source.

Although no power factor requirements are established by this SR, the DG is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while the 1.0 is an operational limitation to ensure circulating currents are minimized. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

~~The normal 92 day Frequency for this Surveillance is consistent with Regulatory Guide 1.9 (Ref. 5).~~

This SR is modified by three Notes. Note 1 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients because of changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit will not invalidate the test. Note 3 indicates that all DG starts for this Surveillance may be preceded by an engine prelube period and followed by a warmup period prior to loading. This minimizes wear on moving parts that do not get lubricated.

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.10

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance.

The presence of physical damage or deterioration does not necessarily represent a failure of this SR, provided an evaluation determines that the physical damage or deterioration does not affect the OPERABILITY of the battery (its ability to perform its design function).

Insert 3

~~The 12 month Frequency for this SR is consistent with IEEE-450 (Ref. 4), which recommends detailed visual inspection of cell condition and rack integrity on a yearly basis.~~

SR 3.10.1.11

Visual inspection of battery cell to cell and terminal connections provides an indication of physical damage that could potentially degrade battery performance. The anti-corrosion material is used to help ensure good electrical connections and to reduce terminal deterioration. The visual inspection for corrosion is not intended to require removal of and inspection under each terminal connection.

The limits established for this SR must be no more than 20% above the resistance as measured during installation or not above the ceiling value established by the manufacturer.

~~The Surveillance Frequency for these inspections is 12 months. This Frequency is considered acceptable based on operating experience related to detecting corrosion trends.~~

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.12

A battery service test is a special test of the battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length correspond to the design duty cycle requirements. The design basis discharge time for the SSF battery is one hour.

Insert 3

The Surveillance ~~Frequency~~ for this test is ~~12 months~~. ~~This Frequency is considered acceptable based on operating experience.~~

SR 3.10.1.13

CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and bistable setpoint errors are within the assumptions of the setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint analysis. ~~This Frequency is justified by the assumption of an 18 month calibration interval to determine the magnitude of equipment drift in the setpoint analysis.~~

SR 3.10.1.14

Inservice Testing of the SSF valves demonstrates that the valves are mechanically OPERABLE and will operate when required. These valves are required to operate to ensure the required flow path.

The specified Frequency is in accordance with the IST Program requirements. Operating experience has shown that these components usually pass the SR when performed at the IST Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

Amendment Nos.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.15

This SR requires the SSF pumps to be tested in accordance with the IST Program. The IST verifies the required flow rate at a discharge pressure to verify OPERABILITY. The SR is modified by a note indicating that it is not applicable to the SSF submersible pump.

The specified Frequency is in accordance with the IST Program requirements. Operating experience has shown that these components usually pass the SR when performed at the IST Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.10.1.16

This SR ~~requires~~ the SSF submersible pump to be ~~tested~~ on ~~a 2~~ year ~~Frequency and~~ verifies the required flow rate at a discharge pressure to verify OPERABILITY.

Insert 3

The specified Frequency is based on the pump being not QA grade and on operating experience that has shown it usually passes the SR when performed at the 2 year Frequency.

REFERENCES

1. UFSAR, Section 9.6.
2. Oconee Probabilistic Risk Assessment.
3. 10 CFR 50.36.
4. IEEE-450-1987.
5. Regulatory Guide 1.9, Rev. 0, December 1974.
6. NRC Letter from L. A. Wiens to H. B. Tucker, "Safety Evaluation Report on Effect of Tornado Missiles on Oconee Emergency Feedwater System," dated July 28, 1989.
7. NRC Letter from L. A. Wiens to J. W. Hampton, "Safety Evaluation for Station Blackout (10 CFR 50.63) - Oconee Nuclear Station, Units 1, 2, and 3," dated March 10, 1992.

Amendment Nos.

BASES

ACTIONS (continued)

B.1

With the Required Action and associated Completion Time not met, or with the required SSF battery with one or more battery cell parameters outside the Category C limit for any connected cell, or with the average electrolyte temperature of representative cells falling below 60°F, sufficient capacity to supply the maximum expected load requirement is not assured and the SSF Power System must be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

SR 3.10.2.1

This SR verifies that Category A battery cell parameters are consistent with IEEE-450 (Ref. 4), which recommends regular battery inspections including voltage, specific gravity, and electrolyte temperature of pilot cells.

Insert 3

SR 3.10.2.2

periodic

The ~~quarterly~~ inspection of specific gravity and voltage is ~~consistent with IEEE-450 (Ref. 4)~~

based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.10.2.3

This Surveillance verification that the average temperature of representative cells is ≥ 60°F is ~~consistent with a recommendation of IEEE-450 (Ref. 4), which states that the temperature of electrolytes in representative cells should be determined on a quarterly basis.~~

Lower than normal temperatures act to inhibit or reduce battery capacity. This SR ensures that the operating temperatures remain within an acceptable operating range. This limit is based on plant specific calculations.

Table 3.10.2-1

This table delineates the limits on electrolyte level, float voltage, and specific gravity for three different categories. The meaning of each category is discussed below.

Category A defines the normal parameter limit for each designated pilot cell in each battery. The cells selected as pilot cells are those whose

Oconee Nuclear Station

Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program (TSTF 425)

License Amendment Request
2009-10

March 2010

ATTACHMENT 4

Technical Specifications and Bases – Retyped Pages

1.1 Definitions

SHUTDOWN MARGIN (SDM) (continued)

b. In MODES 1 and 2, the fuel and moderator temperatures are changed to the nominal zero power design level; and

c. There is no change in APSR position.

THERMAL POWER

THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

3.1 REACTIVITY CONTROL SYSTEMS

3.1.1 SHUTDOWN MARGIN (SDM)

LCO 3.1.1 The SDM shall be within the limit specified in the COLR.

APPLICABILITY: MODES 3, 4, and 5.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. SDM not within limit.	A.1 Initiate boration to restore SDM to within limit.	15 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.1.1	Verify SDM is within the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.2.1	-----NOTES----- The predicted reactivity values may be adjusted (normalized) to correspond to the measured core reactivity prior to exceeding a fuel burnup of 60 effective full power days (EFPD) after each fuel loading. -----	
	Verify measured core reactivity balance is within ±1% Δk/k of predicted values.	Prior to entering MODE 1 after each fuel loading AND -----NOTE----- Only required after 60 EFPD ----- In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.4.1	Verify individual CONTROL ROD positions are within 6.5% of their group average height.	In accordance with the Surveillance Frequency Control Program
SR 3.1.4.2	Verify CONTROL ROD freedom of movement (trippability) by moving each individual CONTROL ROD that is not fully inserted by an amount in any direction sufficient to demonstrate the absence of thermal binding.	In accordance with the Surveillance Frequency Control Program
SR 3.1.4.3	Verify the rod drop time for each CONTROL ROD, from the fully withdrawn position, is $\leq$ 1.66 seconds at reactor coolant full flow conditions or $\leq$ 1.40 seconds at no flow conditions from power interruption at the CONTROL ROD drive breakers to ¾ insertion (25% withdrawn position).	Prior to reactor criticality after each removal of the reactor vessel head

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. More than one safety rod not fully withdrawn.	B.1.1 Verify SDM is within the limit specified in the COLR.	1 hour
	OR	
	B.1.2 Initiate boration to restore SDM to within limit.	1 hour
	AND	
	B.2 Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.5.1	Verify each safety rod is fully withdrawn.	In accordance with the Surveillance Frequency Control Program

3.1 REACTIVITY CONTROL SYSTEMS

3.1.6 AXIAL POWER SHAPING ROD (APSR) Alignment Limits

LCO 3.1.6 Each APSR shall be OPERABLE and aligned within 6.5% of its group average height.

APPLICABILITY: MODES 1 and 2, when the APSRs are not fully withdrawn.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One APSR inoperable, not aligned within its limits, or both.	A.1 Perform SR 3.2.2.1.	2 hours <u>AND</u> 2 hours after each APSR movement
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.1.6.1 Verify position of each APSR is within 6.5% of the group average height.	In accordance with the Surveillance Frequency Control Program

3.1 REACTIVITY CONTROL SYSTEMS

3.1.7 Position Indicator Channels

LCO 3.1.7 One position indicator channel for each CONTROL ROD and APSR shall be OPERABLE.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. The required position indicator channel inoperable for one or more rods.	A.1 Declare the rod(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.7.1	Perform CHANNEL CHECK of required position indicator channel.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. SDM not within limit.	B.1 Initiate boration to restore SDM to within limit. <u>AND</u> B.2 Suspend PHYSICS TESTS exceptions.	15 minutes 1 hour
C. Nuclear overpower trip setpoint is not within limit. <u>OR</u> Nuclear instrumentation wide range high startup rate CONTROL ROD withdrawal inhibit inoperable.	C.1 Suspend PHYSICS TESTS exceptions.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.1.8.1	Verify nuclear overpower trip setpoint is $\leq$ 5% RTP.	Once within 8 hours prior to performance of PHYSICS TESTS
SR 3.1.8.2	Verify SDM is within the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify regulating rod groups are within the sequence and overlap limits as specified in the COLR.	In accordance with the Surveillance Frequency Control Program
SR 3.2.1.2	Verify regulating rod groups meet the position limits as specified in the COLR.	In accordance with the Surveillance Frequency Control Program
SR 3.2.1.3	Verify SDM to be within the limit as specified in the COLR.	Within 4 hours prior to achieving criticality

3.2 POWER DISTRIBUTION LIMITS

3.2.2 AXIAL POWER IMBALANCE Operating Limits

LCO 3.2.2 AXIAL POWER IMBALANCE shall be maintained within the limits specified in the COLR.

APPLICABILITY: MODE 1 with THERMAL POWER > 40% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. AXIAL POWER IMBALANCE not within limits.	A.1 Restore AXIAL POWER IMBALANCE to within limits.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to ≤ 40% RTP.	2 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.2.1	Verify AXIAL POWER IMBALANCE is within limits as specified in the COLR.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify QPT is within limits as specified in the COLR.	In accordance with the Surveillance Frequency Control Program AND When QPT has been restored to less than or equal to the steady state limit, 1 hour for 12 consecutive hours, or until verified acceptable at ≥ 95% RTP

SURVEILLANCE REQUIREMENTS

---NOTE---
Refer to Table 3.3.1-1 to determine which SRs apply to each RPS Function.

SURVEILLANCE		FREQUENCY
SR 3.3.1.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.2	-----------------------NOTE----------------------- Not required to be performed until 24 hours after THERMAL POWER is ≥ 15% RTP. --- Compare results of calorimetric heat balance calculation to the power range channel output and adjust power range channel output if calorimetric exceeds power range channel output by ≥ 2% RTP.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.3	-----------------------NOTE----------------------- Not required to be performed until 24 hours after THERMAL POWER is ≥ 15% RTP. --- Compare out of core measured AXIAL POWER IMBALANCE (API_0) to incore measured AXIAL POWER IMBALANCE (API_I) as follows: $(RTP/TP)(API_0 - (CS \times API_I))$ = imbalance error where CS is CORRELATION SLOPE Adjust power range channel output if the absolute value of imbalance error is ≥ 2% RTP.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.4	------------------------NOTE------------------------ Not applicable to Unit(s) with RPS digital upgrade complete. --- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.5	------------------------NOTE------------------------ Only applicable to Unit(s) with RPS digital upgrade complete. --- Manually verify the setpoints are correct.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.6	------------------------NOTE------------------------ Only applicable to Unit(s) with RPS digital upgrade complete. --- Manually actuate the output channel interposing relays.	In accordance with the Surveillance Frequency Control Program
SR 3.3.1.7	------------------------NOTE------------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Two or more RTCs inoperable in MODE 1, 2, or 3. OR Required Action and associated Completion Time not met in MODE 1, 2, or 3.	B.1 Be in MODE 3. AND B.2.1 Open all CRD trip breakers. OR B.2.2 Remove power from all CRD trip breakers.	12 hours 12 hours 12 hours
C. Two or more RTCs inoperable in MODE 4 or 5. OR Required Action and associated Completion Time not met in MODE 4 or 5.	C.1 Open all CRD trip breakers. OR C.2 Remove power from all CRD trip breakers.	6 hours 6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.3.1 Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time not met in MODE 1, 2, or 3.	C.1	Be in MODE 3.	12 hours
	<u>AND</u>		
	C.2.1	Open all CRD trip breakers.	12 hours
	<u>OR</u>		
	C.2.2	Remove power from all CRD trip breakers.	12 hours
D. Required Action and associated Completion Time not met in MODE 4 or 5.	D.1	Open all CRD trip breakers.	6 hours
	<u>OR</u>		
	D.2	Remove power from all CRD trip breakers.	6 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.4.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.2.2 -----------NOTE----------- Only required for RCS Pressure – Low Low. ------------------------------	
	Reduce RCS pressure < 900 psig.	36 hours
	<u>AND</u>	
	B.2.3 ----------NOTE------------ Only required for Reactor Building Pressure – High and High High. ------------------------------	
	Be in MODE 5.	36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.5.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.5.2	-------------------------NOTE-------------------------- Only applicable to Unit(s) with ESPS digital upgrade complete. --- Manually verify that the setpoints are correct.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.3	-------------------------NOTE-------------------------- Not applicable to Unit(s) with ESPS digital upgrade complete. --- Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.5.4	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.6.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.7.1	-------------------------NOTE-------------------------- Only applicable to Unit(s) with the ESPS digital upgrade complete --- Manually actuate the output channel interposing relays.	In accordance with the Surveillance Frequency Control Program
SR 3.3.7.2	Perform automatic actuation output logic CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

-----NOTE-----
These SRs apply to each PAM instrumentation Function in Table 3.3.8-1 except where indicated.

	SURVEILLANCE	FREQUENCY
SR 3.3.8.1	Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.2	-----NOTE----- Only applicable to PAM Functions 7 and 22. ----- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.8.3	-----NOTES----- 1. Neutron detectors are excluded from CHANNEL CALIBRATION. 2. Not applicable to PAM Functions 7 and 22. ----- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.4 Verify SDM to be within the limit specified in the COLR.	1 hour AND Once per 12 hours thereafter
C. One or more required source range neutron flux channel(s) inoperable with THERMAL POWER level > 4E-4% RTP on the wide range neutron flux channels.	C.1 Initiate action to restore affected channel(s) to OPERABLE status.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.9.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.9.2	-------------------------NOTE------------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.10.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.10.2	-------------------------NOTE------------------------- Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program
SR 3.3.10.3	Verify at least one decade overlap between source range and wide range neutron flux channels.	Once each reactor startup prior to the source range indication exceeding 10^5 cps if not performed within the previous 7 days

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition B not met.	C.1	Be in MODE 3.	12 hours
	AND		
	C.2	Reduce main steam header pressure to <700 psig.	18 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.11.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.11.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.11.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.12.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION

3.3.13 Automatic Feedwater Isolation System (AFIS) Digital Channels

LCO 3.3.13 Two AFIS digital channels per steam generator (SG) shall be OPERABLE.

APPLICABILITY: MODES 1 and 2,
MODE 3 with main steam header pressure $\geq$ 700 psig.

ACTIONS

---NOTE---
Separate Condition entry is allowed for each SG.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One digital channel inoperable.	A.1 Restore digital channel to OPERABLE status.	72 hours
B. Two digital channels inoperable. OR Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Reduce main steam header pressure to $<$ 700 psig	12 hours 18 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.13.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION

3.3.14 Emergency Feedwater (EFW) Pump Initiation Circuitry

LCO 3.3.14 Two loss of main feedwater (LOMF) pump instrumentation channels for each automatic initiation circuit, and an automatic and manual initiation circuit for each EFW pump shall be OPERABLE.

------------------------------------NOTE------------------------------------
The EFW pump automatic initiation circuit is not required to be OPERABLE in MODES 3 and 4.

APPLICABILITY: MODES 1, 2 and 3,
MODE 4 when the steam generator is relied upon for heat removal.

ACTIONS

--NOTE--
Separate Condition entry is allowed for each EFW pump initiation circuit.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more EFW pump automatic initiation circuits with one LOMF channel inoperable.	A.1 Place channel(s) in trip.	1 hour
B. One or more required EFW pump initiation circuits inoperable. <u>OR</u> Required Action and associated Completion Time not met.	B.1 Declare the affected EFW pump(s) inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.14.1	Perform CHANNEL FUNCTIONAL TEST for each LOMF pump instrumentation channel.	In accordance with the Surveillance Frequency Control Program
SR 3.3.14.2	Perform CHANNEL FUNCTIONAL TEST for each manual initiation circuit.	In accordance with the Surveillance Frequency Control Program
SR 3.3.14.3	Perform CHANNEL FUNCTIONAL TEST for each automatic initiation circuit.	In accordance with the Surveillance Frequency Control Program
SR 3.3.14.4	Perform CHANNEL CALIBRATION for each LOMF pump instrumentation channel.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION

3.3.15 Turbine Stop Valve (TSV) Closure

LCO 3.3.15 Two TSV Closure channels shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3 except when all TSVs are closed.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more TSV Closure channel(s) inoperable.	A.1 Declare the TSVs inoperable.	1 hour

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.15.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.16.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.16.2	Perform CHANNEL FUNCTIONAL TEST.	Once each refueling outage prior to movement of recently irradiated fuel assemblies within containment
SR 3.3.16.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION

3.3.17 Emergency Power Switching Logic (EPSL) Automatic Transfer Function

LCO 3.3.17 Two channels of the EPSL Automatic Transfer Function shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION		COMPLETION TIME
A. One channel inoperable.	A.1	-----------NOTE----------- The Completion Time is reduced when in Condition L of LCO 3.8.1. ------------------------------	
		Restore channel to OPERABLE status.	24 hours
B. Required Action and associated Completion Time not met.	B.1	Be in MODE 3.	12 hours
	<u>AND</u>		
	B.2	Be in MODE 5.	84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.17.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time not met in MODES 1, 2, 3, and 4.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	12 hours 84 hours
C. Two or more channels of a required circuit inoperable when not in MODES 1, 2, 3, and 4. OR Required Action and associated Completion Time not met when not in MODES 1, 2, 3, and 4.	C.1 Declare affected AC power source(s) inoperable.	Immediately
D. Required Action and associated Completion Time not met during movement of irradiated fuel assemblies.	D.1 Suspend movement of irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.3.18.1 Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Two or more voltage sensing channels inoperable. OR Two actuation logic channels inoperable.	D.1 Declare the overhead emergency power path inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.19.1	Perform a CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.19.2	Perform a CHANNEL CALIBRATION of the voltage sensing channel with the setpoint allowable value as follows: Degraded voltage $\geq$ 226 kV and $\leq$ 229 kV with a time delay of 9 seconds $\pm$ 1 second.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.20.1	Perform a CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.20.2	Perform a CHANNEL CALIBRATION of the voltage sensing channel with the setpoint allowable value as follows: a. Degraded voltage ≥ 4143 V and ≤ 4185 V with a time delay of 9 seconds ± 1 second for the first level undervoltage inputs; and b. Degraded voltage ≥ 3871 V and ≤ 3901 V for the second level undervoltage inputs.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.21.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION

3.3.22 Emergency Power Switching Logic (EPSL) Manual Keowee Emergency Start Function

LCO 3.3.22 One channel of the EPSL Manual Keowee Emergency Start Function shall be OPERABLE.

APPLICABILITY: MODES 5 and 6,
During movement of irradiated fuel assemblies.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required channel inoperable.	A.1 Declare both Keowee Hydro Units inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.22.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time not met.	D.1 Initiate action in accordance with Specification 5.6.6.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.23.1	Perform a CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.27.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.3.27.2	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.27.3	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

3.3 INSTRUMENTATION

3.3.28 Low Pressure Service Water (LPSW) Standby Pump Auto-Start Circuitry

LCO 3.3.28 LPSW Standby Pump Auto-Start Circuitry shall be OPERABLE.

-----------------------------------NOTE-----------------------------------
LPSW Standby Pump auto-start circuit is not required to be OPERABLE on running LPSW pumps.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. LPSW standby pump auto-start circuitry inoperable.	A.1 Restore LPSW standby pump auto-start circuitry to OPERABLE status.	7 days
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3.	12 hours
	<u>AND</u>	
	B.2 Be in MODE 5.	60 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.3.28.1	Perform CHANNEL FUNCTIONAL TEST.	In accordance with the Surveillance Frequency Control Program
SR 3.3.28.2	Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.1.1	-------------------------NOTE------------------------ With three RCPs operating, the limits are applied to the loop with the highest pressure. --- Verify RCS loop pressure is within limits specified in the COLR.	 In accordance with the Surveillance Frequency Control Program
SR 3.4.1.2	-------------------------NOTE------------------------ With three RCPs operating, the limits are applied to the loop with the lowest loop average temperature for the condition where there is a 0°F ΔTc setpoint. --- Verify RCS loop average temperature is within limits specified in the COLR.	 In accordance with the Surveillance Frequency Control Program
SR 3.4.1.3	Verify RCS total flow is within limits specified in the COLR.	In accordance with the Surveillance Frequency Control Program
SR 3.4.1.4	-------------------------NOTE------------------------ Not required to be performed until 7 days after stable thermal conditions are established in the higher power range of MODE 1. --- Verify by measurement RCS total flow rate is within limit specified in the COLR.	 In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

*CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	12 hours 36 hours
C. -----------NOTE------------ Required Action C.2 shall be completed whenever this Condition is entered. ------------------------------- Requirements of LCO not met in other than MODE 1, 2, 3, or 4.	C.1 Initiate action to restore parameter(s) to within limit. AND C.2 Determine RCS is acceptable for continued operation.	Immediately Prior to entering MODE 4

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.3.1	-----------------------NOTE------------------------- Only required to be performed during RCS heatup and cooldown operations and RCS leak and hydrostatic testing. -- Verify RCS pressure, RCS temperature and RCS heatup and cooldown rates are within limits.	In accordance with the Surveillance Frequency Control Program

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.4 RCS Loops – MODES 1 and 2

LCO 3.4.4 Two RCS Loops shall be in operation, with:

a. Four reactor coolant pumps (RCPs) operating; or

b. Three RCPs operating and THERMAL POWER restricted to 75% RTP.

APPLICABILITY: MODES 1 and 2.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of LCO not met.	A.1 Be in MODE 3.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.4.1	Verify required RCS loops are in operation.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Two RCS loops inoperable. <u>OR</u> Required RCS loop not in operation.	C.1	Suspend all operations involving a reduction of RCS boron concentration.	Immediately
	<u>AND</u>		
	C.2	Initiate action to restore one RCS loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.5.1	Verify required RCS loop is in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.5.2	Verify correct breaker alignment and indicated power available to the required pump that is not in operation.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Two required loops inoperable. OR Required loop not in operation.	B.1	Suspend all operations involving a reduction in RCS boron concentration.	Immediately
	AND		
	B.2	Initiate action to restore one loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.6.1	Verify required DHR or RCS loop is in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.6.2	Verify correct breaker alignment and indicated power available to the required pump that is not in operation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.7.1	Verify required DHR loop is in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.7.2	Verify required SG secondary side water levels are ≥ 50%.	In accordance with the Surveillance Frequency Control Program
SR 3.4.7.3	Verify correct breaker alignment and indicated power available to the required DHR pump that is not in operation.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
B. Two DHR loops inoperable. OR Required DHR loop not in operation.	B.1	Suspend all operations involving reduction in RCS boron concentration.	Immediately
	AND		
	B.2	Initiate action to restore one DHR loop to OPERABLE status and operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.8.1	Verify required DHR loop is in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.4.8.2	Verify correct breaker alignment and indicated power available to the required DHR pump that is not in operation.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time of Condition C not met.	D.1 Be in MODE 3.	12 hours
	AND	
	D.2 Reduce RCS temperature to ≤ 325°F.	18 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.9.1	Verify pressurizer water level ≤ 285 inches.	In accordance with the Surveillance Frequency Control Program
SR 3.4.9.2	Verify capacity of required pressurizer heaters and associated power supplies are ≥ 400 kW.	In accordance with the Surveillance Frequency Control Program

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Gross specific activity of the coolant not within limit.	C.1	Be in MODE 3 with RCS Average Temperature < 500°F.	12 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.11.1	Verify reactor coolant gross specific activity $\leq 100/\bar{E}$ μCi/gm.	In accordance with the Surveillance Frequency Control Program
SR 3.4.11.2	--------------------------NOTE------------------------ Only required to be performed in MODE 1. -- Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm.	In accordance with the Surveillance Frequency Control Program <u>AND</u> Between 2 and 6 hours after THERMAL POWER change of ≥ 15% RTP within a 1 hour period
SR 3.4.11.3	--------------------------NOTE------------------------ Not required to be performed until 31 days after a minimum of 2 EFPD and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for ≥ 48 hours. -- Determine $\bar{E}$.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.12.1	Verify HPI is deactivated.	In accordance with the Surveillance Frequency Control Program
SR 3.4.12.2	Verify each CFT is isolated.	In accordance with the Surveillance Frequency Control Program
SR 3.4.12.3	Verify pressurizer level is ≤ level necessary to assure ≥ 10 minutes are available for operator action to mitigate an LTOP event.	30 minutes during RCS heatup and cooldown <u>AND</u> In accordance with the Surveillance Frequency Control Program
SR 3.4.12.4	Verify PORV block valve is open.	In accordance with the Surveillance Frequency Control Program
SR 3.4.12.5	Perform CHANNEL FUNCTIONAL TEST for PORV.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.4.12.6	Verify Administrative Controls, other than limits for pressurizer level, that assure ≥ 10 minutes are available for operator action to mitigate an LTOP event are implemented for the following: a. RCS pressure when RCS temperature is < 325°F; b. Makeup flow rate; c. Alarms; d. High pressure Nitrogen System; and e. Verify pressurizer heater bank 3 or 4 is deactivated	In accordance with the Surveillance Frequency Control Program
SR 3.4.12.7	Perform CHANNEL CALIBRATION for PORV.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.13.1	-------------------------NOTES----------------------- 1. Not required to be performed until 12 hours after establishment of steady state operation. 2. Not applicable to primary to secondary LEAKAGE. --- Evaluate RCS Operational LEAKAGE.	In accordance with the Surveillance Frequency Control Program
SR 3.4.13.2	-------------------------NOTE----------------------- Not required to be performed until 12 hours after establishment of steady state operation. --- Verify primary to secondary LEAKAGE is ≤ 150 gallons per day through any one SG.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.14.1	------------------------NOTE------------------------ Not required to be performed in MODES 3 and 4. --- Verify leakage from each required RCS PIV is equivalent to ≤ 0.5 gpm per nominal inch of valve size up to a maximum of 5 gpm at an RCS pressure ≥ 2150 psia and ≤ 2190 psia.	In accordance with the Surveillance Frequency Control Program <u>AND</u> Prior to entering MODE 2 whenever the unit has been in MODE 5 for ≥ 7 days, if leakage testing has not been performed in the previous 9 months.

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.4.15.1	Perform CHANNEL CHECK of required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.2	Perform CHANNEL FUNCTIONAL TEST of required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.3	Perform CHANNEL CALIBRATION of required containment sump level indication.	In accordance with the Surveillance Frequency Control Program
SR 3.4.15.4	Perform CHANNEL CALIBRATION of required containment atmosphere radioactivity monitor.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.1.1	Verify each CFT isolation valve is fully open.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.2	Verify borated water volume in each CFT is $\geq 1010\ ft^3$ and $\leq 1070\ ft^3$.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.3	Verify nitrogen cover pressure in each CFT is $\geq$ 575 psig and $\leq$ 625 psig.	In accordance with the Surveillance Frequency Control Program
SR 3.5.1.4	Verify boron concentration in each CFT is within the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program <u>AND</u> ----------NOTE------------ Only required to be performed for affected CFT ----------------------------- Once within 12 hours after each solution volume increase of $\geq$ 80 gallons that is not the result of addition from a borated water source that meets CFT boron concentration requirements.

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.1.5	Verify power is removed from each CFT isolation valve operator.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
F. One LPI-HPI flow path inoperable.	F.1 Restore LPI-HPI flow path to OPERABLE status.	72 hours
G. Required Action and associated Completion Time of Condition B, C, D, E, or F not met.	G.1 Be in MODE 3. AND G.2 Reduce RCS temperature to $\leq$ 350°F.	12 hours 60 hours
H. Two HPI trains inoperable. OR Two LPI-HPI flow paths inoperable.	H.1 Enter LCO 3.0.3.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.2.1	Verify each HPI manual and non-automatic power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.2	-------------------------NOTE-------------------------- Not applicable to operating HPI pump(s). --- Vent each HPI pump casing.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.2.3	Verify each HPI pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.5.2.4	Verify each HPI automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.5	Verify each HPI pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.6	Verify, by visual inspection, each HPI train reactor building sump suction inlet is not restricted by debris and suction inlet strainers show no evidence of structural distress or abnormal corrosion.	In accordance with the Surveillance Frequency Control Program
SR 3.5.2.7	Cycle each HPI discharge crossover valve and LPI-HPI flow path discharge valve.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION		COMPLETION TIME
C. Required Action and associated Completion Time of Condition A or B not met.	C.1	Be in MODE 3.	12 hours
	AND		
	C.2	Be in MODE 4.	60 hours
D. One required LPI train inoperable in MODE 4.	D.1	Initiate action to restore required LPI train to OPERABLE status.	Immediately
	AND		
	D.2	----------NOTE----------- Only required if DHR loop is OPERABLE. --------------------------- Be in MODE 5.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.3.1	Verify each LPI manual and non-automatic power operated valve in the flow path, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.5.3.2	-----------------------NOTE----------------------- Not applicable to operating LPI pump(s). --- Vent each LPI pump casing.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.3	Verify each LPI pump's developed head at the test flow point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.5.3.4	Verify each LPI automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.5	Verify each LPI pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.5.3.6	Verify, by visual inspection, each LPI train reactor building sump suction inlet is not restricted by debris and suction inlet strainers show no evidence of structural distress or abnormal corrosion.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.5.4.1	-------------------------NOTE------------------------- Only required to be performed when ambient air temperature is < 45°F or > 115°F. --- Verify BWST borated water temperature is ≥ 45°F and ≤ 115°F.	In accordance with the Surveillance Frequency Control Program
SR 3.5.4.2	Verify BWST borated water volume is ≥ 350,000 gallons.	In accordance with the Surveillance Frequency Control Program
SR 3.5.4.3	Verify BWST boron concentration is: a. Within limits specified in the COLR; AND b. ≥ 2220 ppm.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.2.1	-------------------------NOTES---------------------- 1. An inoperable air lock door does not invalidate the previous successful performance of the overall air lock leakage test. 2. Results shall be evaluated against acceptance criteria of SR 3.6.1.2 in accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions. --- Perform required air lock leakage rate testing in accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions.	------------NOTE------------- SR 3.0.2 is not applicable --------------------------------- In accordance with 10 CFR 50, Appendix J, Option A, as modified by approved exemptions
SR 3.6.2.2	Verify only one door in the air lock can be opened at a time.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.6.3.1	Verify each 48 inch purge valve is sealed closed.	In accordance with the Surveillance Frequency Control Program
SR 3.6.3.2	-------------------------NOTE------------------------- Valves and blind flanges in high radiation areas may be verified by use of administrative means. -- Verify each containment isolation manual and non-automatic power operated valve and blind flange that is located outside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	In accordance with the Surveillance Frequency Control Program
SR 3.6.3.3	-------------------------NOTE------------------------- Valves and blind flanges in high radiation areas may be verified by use of administrative means. -- Verify each containment isolation manual and non-automatic power operated valve and blind flange that is located inside containment and not locked, sealed, or otherwise secured and required to be closed during accident conditions is closed, except for containment isolation valves that are open under administrative controls.	Prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.3.4	Verify the isolation time of each automatic power operated containment isolation valve is within limits.	In accordance with the Inservice Testing Program
SR 3.6.3.5	Verify each automatic containment isolation valve that is not locked, sealed, or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program

3.6 CONTAINMENT SYSTEMS

3.6.4 Containment Pressure

LCO 3.6.4 Containment pressure shall be ≥ -2.45 psig and ≤ +1.2 psig.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Containment pressure not within limits.	A.1 Restore containment pressure to within limits.	1 hour
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.6.4.1 Verify containment pressure is within limits.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.5.1	---------------------NOTE-------------------------- Applicable for RB cooling system after the completion of the LPSW RB Waterhammer Modification on the respective Unit. --- Verify each reactor building spray and cooling manual and non-automatic power operated valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.6.5.2	Operate each required reactor building cooling train fan unit for ≥ 15 minutes.	In accordance with the Surveillance Frequency Control Program
SR 3.6.5.3	Verify each required reactor building spray pump's developed head at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.6.5.4	Verify that the containment heat removal capability is sufficient to maintain post accident conditions within design limits.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.6.5.5	---------------------NOTE------------------------- Applicable for RB cooling system after the completion of the LPSW RB Waterhammer Modification on the respective Unit. -- Verify each automatic reactor building spray and cooling valve in each required flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.5.6	Verify each required reactor building spray pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.5.7	Verify each required reactor building cooling train starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.6.5.8	Verify each spray nozzle is unobstructed.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.2.1	-------------------------NOTE-------------------------- Only required to be performed in MODES 1 and 2. -- Verify closure time of each TSV is ≤ 1.0 seconds on an actual or simulated actuation signal from Channel A.	In accordance with the Surveillance Frequency Control Program
SR 3.7.2.2	-------------------------NOTE-------------------------- Only required to be performed in MODES 1 and 2. -- Verify closure time of each TSV is ≤ 1.0 second on an actual or simulated actuation signal from Channel B.	In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.4 Atmospheric Dump Valve (ADV) Flow Paths

LCO 3.7.4 The ADV flow path for each steam generator shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3, and MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or both ADV flow path(s) inoperable.	A.1 Be in MODE 3.	12 hours
	AND	
	A.2 Be in MODE 4 without reliance upon steam generator for heat removal.	24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.4.1	Cycle the valves that comprise the ADV flow paths.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.7.5.1	Verify each EFW manual, and non-automatic power operated valve in each water flow path and in the steam supply flow path to the turbine driven pump, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.7.5.2	Verify the developed head of each EFW pump at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.7.5.3	-------------------------NOTE------------------------ Not required to be met in MODES 3 and 4. --- Verify each EFW automatic valve that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.5.4	-------------------------NOTE------------------------ Not required to be met in MODES 3 and 4. --- Verify each EFW pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.5.5	Verify proper alignment of the required EFW flow paths by verifying valve alignment from the upper surge tank to each steam generator.	Prior to entering MODE 2 whenever unit has been in MODE 5 or 6 for > 30 days

3.7 PLANT SYSTEMS

3.7.6 Upper Surge Tank (UST) and Hotwell (HW)

LCO 3.7.6 The UST and HW shall be OPERABLE.

APPLICABILITY: MODES 1, 2, and 3,
MODE 4 when steam generator is relied upon for heat removal.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of the LCO not met.	A.1 Be in MODE 3. <u>AND</u> A.2 Be in MODE 4 without reliance on steam generator for heat removal.	12 hours 24 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.6.1	Verify combined inventory in the UST and HW is ≥ 155,000 gal. <u>AND</u> Inventory in the UST is ≥ 30,000 gal.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.7.1	Verify LPSW leakage accumulator level is within Water levels between 20.5" to 41" for Units with LPSW RB Waterhammer modification installed. During LPSW testing, accumulator level > 41" is acceptable.	In accordance with the Surveillance Frequency Control Program
SR 3.7.7.2	-------------------------NOTE------------------------- Isolation of LPSW flow to individual components does not render the LPSW System inoperable. --- Verify each LPSW manual, and non-automatic power operated valve in the flow path servicing safety related equipment, that is not locked, sealed, or otherwise secured in position, is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.7.7.3	Verify each LPSW automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.7.4	Verify each LPSW pump starts automatically on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.7.7.5	Verify LPSW leakage accumulator is able to provide makeup flow lost due to boundary valve leakage on Units with LPSW RB Waterhammer modification installed.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.7.6	Verify LPSW WPS boundary valve leakage is ≤ 20 gpm for Units with LPSW RB Waterhammer modification installed.	In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.8 Emergency Condenser Circulating Water (ECCW) System

LCO 3.7.8 Two ECCW siphon headers shall be OPERABLE.

---NOTE---
Not applicable on each Unit until after completion of the Service Water upgrade modifications on the respective Unit.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One required ECCW siphon header inoperable.	A.1. Restore required ECCW siphon header to OPERABLE status.	72 hours
B. Required Action and associated Completion Time not met.	B.1 Be in MODE 3. AND B.2 Be in MODE 5.	12 hours 60 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.8.1	Verify required Essential Siphon Vacuum (ESV) pumps are in operation.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.8.2	Verify Keowee Lake water level is within limits.	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.3	Verify average water temperature of Condenser Circulating Water (CCW) inlet is $\leq 90°F$.	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.4	Verify each manual and non-automatic power operated valve in each ECCW siphon header flow path, required ESV flow paths and required SSW flow paths that is not locked, sealed, or otherwise secured in position is in the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.5	Verify upon an actual or simulated actuation signal each ESV float valve actuates to the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.6	Verify upon an actual or simulated actuation signal each required ESV and Siphon Seal Water (SSW) valve actuates to the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.7	Verify the developed capacity of each required ESV pump at the test point is greater than or equal to the required capacity.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.7.8.8	Verify each required ESV pump automatically starts in ≤ 1200 seconds upon an actual or simulated restoration of emergency power.	In accordance with the Surveillance Frequency Control Program
SR 3.7.8.9	-----------------------NOTE-------------------------- Not required to be performed for Units 1 and 2 with the shared Unit 1 and 2 LPSW System taking suction from the siphon. --- Verify upon an actual or simulated trip of the CCW pumps and ESV pumps that the rate of water level drop in the ECCW siphon header is within limits.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. Required Action and associated Completion Time not met in MODE 1, 2, 3, or 4.	D.1 Be in MODE 3. AND D.2 Be in MODE 5	12 hours 36 hours
E. Required Action and associated Completion Time not met during movement of recently irradiated fuel assemblies.	E.1 Suspend movement of recently irradiated fuel assemblies.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.9.1	Operate each CRVS Booster Fan train for ≥ 1 hour.	In accordance with the Surveillance Frequency Control Program
SR 3.7.9.2	Perform required CRVS Booster Fan train filter testing in accordance with the Ventilation Filter Testing Program (VFTP).	In accordance with the VFTP
SR 3.7.9.3	Verify two CRVS Booster Fan trains can maintain the Control Room at a positive pressure.	In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.11 Spent Fuel Pool Water Level

LCO 3.7.11 The Spent Fuel Pool water level shall be ≥ 21.34 ft over the top of irradiated fuel assemblies seated in the storage racks.

APPLICABILITY: During movement of irradiated fuel assemblies in the Spent Fuel Pool,
During movement of cask over the Spent Fuel Pool.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Spent Fuel Pool water level not within limit.	------------------NOTE------------------ LCO 3.0.3 is not applicable. --	
	A.1 Suspend movement of irradiated fuel assemblies in Spent Fuel Pool.	Immediately
	<u>AND</u>	
	A.2 Suspend movement of cask over Spent Fuel Pool.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.7.11.1 Verify the Spent Fuel Pool water level is ≥ 21.34 ft above the top of irradiated fuel assemblies seated in the storage racks.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.12.1	Verify the spent fuel pool boron concentration is: a. Within limits specified in the COLR; AND b. $\geq$ 2220 ppm.	In accordance with the Surveillance Frequency Control Program

3.7 PLANT SYSTEMS

3.7.14 Secondary Specific Activity

LCO 3.7.14 The specific activity of the secondary coolant shall be ≤ 0.10 μCi/gm DOSE EQUIVALENT I-131.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Specific activity not within limit.	A.1 Be in MODE 3. AND A.2 Be in MODE 5.	12 hours 36 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.14.1	Verify the specific activity of the secondary coolant is ≤ 0.10 μCi/gm DOSE EQUIVALENT I-131.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.7.16.1	Verify temperature in Control Room and Cable Room is ≤ 80°F and temperature in Electrical Equipment Room is ≤ 85°F.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
M. Required Action and associated Completion Time for Condition C, F, G, H, I, J, K or L not met. OR Required Action and associated Completion Time not met for Required Action D.1 or D.3.	M.1 Be in MODE 3. AND M.2 Be in MODE 5.	12 hours 84 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.1.1	Verify correct breaker alignment and indicated power availability for each required offsite source.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.2	Verify battery terminal voltage is ≥ 125 V on float charge for each KHU's battery.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.3	Verify the KHU associated with the underground emergency power path starts automatically and energizes the underground emergency power path. Manually close the SK breaker to each de-energized standby bus.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.4	-----------------------NOTE-------------------------- The requirement to energize the underground emergency power path is not applicable 1) when the overhead disconnects are open for the KHU associated with the underground emergency power path or 2) when complying with Required Action D.1. --- Verify the KHU associated with the overhead emergency power path starts automatically and automatically or manually synchronize it to the Yellow bus in 230 kV switchyard. Energize the underground emergency power path after removing the KHU from the overhead emergency power path.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.5	-------------------------NOTE------------------------- Not required to be performed for an SL breaker when its standby bus is energized from a LCT via an isolated power path. --- Verify each closed SL and each closed N breaker opens manually or on an actual or simulated actuation signal.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.6	-------------------------NOTE------------------------- Not required to be performed for an S breaker when its standby bus is energized from a LCT via an isolated power path. --- Operate each S and each E breaker through a full cycle.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.7	Verify both KHU's underground tie breakers cannot be closed simultaneously.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.8	Verify each KHU's overhead emergency power path tie breaker cannot be closed when tie breaker to underground emergency power path is closed.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.9	Verify on an actual or simulated emergency actuation signal each KHU auto starts and: a. Achieves frequency ≥ 57 Hz and ≤ 63 Hz and voltage ≥ 13.5 kV and ≤ 14.49 kV in ≤ 23 seconds; and b. Supplies the equivalent of one Unit's Loss of Coolant Accident (LOCA) loads plus two Unit's Loss of Offsite Power (LOOP) loads when synchronized to system grid and loaded at maximum practical rate.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.10	Verify each KHU's battery capacity is adequate to supply, and maintain in OPERABLE status, required emergency loads for design duty cycle when subjected to a battery service test.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.11	Verify each KHU's battery cells, cell end plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.8.1.12	Verify each KHU's battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.13	------------------------NOTE------------------------ Only applicable when the overhead electrical disconnects for the KHU associated with the underground emergency power path are closed. --- Verify on an actual or simulated zone overlap fault signal each KHU's overhead tie breaker and underground tie breaker actuate to the correct position.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.14	------------------------NOTE------------------------ Not required to be performed for an SL breaker when its standby bus is energized from a LCT via an isolated power path. --- Verify each closed SL and closed N breaker opens on an actuation of each redundant trip coil.	In accordance with the Surveillance Frequency Control Program
SR 3.8.1.15	Verify each 230 kV switchyard circuit breaker actuates to the correct position on a switchyard isolation actuation signal.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

	SURVEILLANCE	FREQUENCY
SR 3.8.1.16	------------------------NOTE------------------------- Only applicable when complying with Required Action C.2.2.4. -- Verify one KHU provides an alternate manual AC power source capability by manual or automatic KHU start with manual synchronize, or breaker closure, to energize its non-required emergency power path.	As specified by Required Action C.2.2.4
SR 3.8.1.17	Verify each KHU's Voltage and Frequency out of tolerance logic trips and blocks closure of the appropriate overhead or underground power path breakers. The allowable values with a time delay of 5 seconds ± 1 second shall be as follows: a. Undervoltage ≥ 12.42 kV and ≤ 12.63 kV b. Overvoltage ≥ 14.90 kV and ≤ 15.18 kV c. Underfrequency ≥ 53.992 hz and ≤ 54.008 hz d. Overfrequency ≥ 65.992 hz and ≤ 66.008 hz	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.3.1	Verify correct breaker alignments and voltage availability from required distribution centers to isolating transfer diodes.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.2	Verify battery terminal voltage is ≥ 125V on float charge.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.3	Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.4	Verify battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.5	Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	In accordance with the Surveillance Frequency Control Program
SR 3.8.3.6	Verify battery capacity is in accordance with the Battery Discharge Testing Program.	In accordance with the Battery Discharge Testing Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.5.1	Verify battery cell parameters meet Table 3.8.5-1 Category A limits.	In accordance with the Surveillance Frequency Control Program
SR 3.8.5.2	Verify battery cell parameters meet Table 3.8.5-1 Category B limits.	In accordance with the Surveillance Frequency Control Program
SR 3.8.5.3	Verify average electrolyte temperature of representative cells is ≥ 60°F.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.6.1	Verify correct inverter voltage, frequency, and alignment to required 120 VAC Vital Instrumentation power panelboards.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.8.7.1	Verify correct inverter voltage, frequency, and alignments to required 120 VAC Vital Instrumentation power panelboards.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
3.8.8.1	Verify correct breaker alignments and voltage to required main feeder buses.	In accordance with the Surveillance Frequency Control Program
3.8.8.2	Verify correct breaker alignments and voltage availability to required ES power strings, 125 VDC Vital I&C power panelboards, 230 kV Switchyard 125 VDC power panelboards and 120 VAC Vital Instrumentation power panelboards.	In accordance with the Surveillance Frequency Control Program

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.2.4 Initiate actions to restore required main feeder buses, ES power strings, 125 VDC Vital I&C power panelboards, 230 kV Switchyard 125 VDC power panelboards or 120 VAC Vital Instrumentation power panelboards to OPERABLE status.	Immediately
	<u>AND</u>	
	A.2.5 Declare associated required decay heat removal loop(s) inoperable and not in operation.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.8.9.1	Verify correct breaker alignments and voltage to required main feeder buses.	In accordance with the Surveillance Frequency Control Program
SR 3.8.9.2	Verify correct breaker alignments and voltage availability to required ES power strings, 125 VDC Vital I&C power panelboards, 230 kV Switchyard 125 VDC power panelboards and 120 VAC Vital Instrumentation power panelboards.	In accordance with the Surveillance Frequency Control Program

3.9 REFUELING OPERATIONS

3.9.1 Boron Concentration

LCO 3.9.1 Boron concentrations of the Reactor Coolant System and the refueling canal shall be maintained within the limit specified in the COLR.

APPLICABILITY: MODE 6.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Boron concentration not within limit.	A.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2 Suspend positive reactivity additions.	Immediately
	AND	
	A.3 Initiate action to restore boron concentration to within limit.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.1.1	Verify boron concentration is within the limit specified in the COLR.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.9.2.1	Perform CHANNEL CHECK.	In accordance with the Surveillance Frequency Control Program
SR 3.9.2.2	-----------------------NOTE------------------------ Neutron detectors are excluded from CHANNEL CALIBRATION. --- Perform CHANNEL CALIBRATION.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.3.1	Verify each required containment penetration is in the required status.	In accordance with the Surveillance Frequency Control Program
SR 3.9.3.2	Verify each required Reactor Building Purge supply and exhaust isolation valve that is not locked, sealed or otherwise secured in the isolation position actuates to the isolation position on an actual or simulated high radiation actuation signal.	Once each refueling outage prior to movement of recently irradiated fuel assemblies within containment

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.4 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.4.1	Verify one DHR loop is in operation.	In accordance with the Surveillance Frequency Control Program

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. (continued)	B.3 Close all containment penetrations providing direct access from containment atmosphere to outside atmosphere.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.5.1	Verify one DHR loop is in operation.	In accordance with the Surveillance Frequency Control Program
SR 3.9.5.2	Verify correct breaker alignment and indicated power available to the required DHR pump that is not in operation.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.6.1	Verify fuel transfer canal water level is $\geq$ 21.34 ft above the top of reactor vessel flange.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.9.7.1	Verify each valve that isolates unborated water sources is secured in the closed position.	In accordance with the Surveillance Frequency Control Program

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.1.1	---------------------NOTE--------------------- Not applicable to RCS temperature instrument channels. -- Perform CHANNEL CHECK for each required SSF instrument channel.	In accordance with the Surveillance Frequency Control Program
SR 3.10.1.2	Verify required SSF battery terminal voltage is ≥ 125 VDC on float charge.	In accordance with the Surveillance Frequency Control Program
SR 3.10.1.3	Verify the day tank contains ≥ 200 gallons of fuel.	In accordance with the Surveillance Frequency Control Program
SR 3.10.1.4	Verify the underground oil storage tank contains ≥ 25,000 gallons of fuel.	In accordance with the Surveillance Frequency Control Program
SR 3.10.1.5	---------------------NOTE--------------------- All DG starts may be preceded by an engine prelube period followed by a warmup period prior to loading. -- Verify the DG starts from standby conditions and achieves steady state voltage and frequency.	In accordance with the Surveillance Frequency Control Program
SR 3.10.1.6	Verify DG required air start receiver pressure is ≥ 150 psig.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.10.1.7	Verify the fuel oil transfer system operates to automatically transfer fuel oil from the storage tank to the day tank.	In accordance with the Surveillance Frequency Control Program
SR 3.10.1.8	Verify the fuel oil properties of the fuel oil stored in the day tank and underground storage tank are tested in accordance with, and maintained within the limits of the Diesel Fuel Oil Testing Program.	In accordance with the Surveillance Frequency Control Program
SR 3.10.1.9	-------------------NOTES------------------- 1. DG loadings may include gradual loading as recommended by the manufacturer. 2. Momentary transients outside the load range do not invalidate this test. 3. All DG starts may be preceded by an engine prelube period followed by a warmup period prior to loading. --- Verify the SSF DG is synchronized and loaded and operated for $\geq$ 60 minutes at a load $\geq$ 3280 kW.	In accordance with the Surveillance Frequency Control Program
SR 3.10.1.10	Verify for required SSF battery that the cells, cell plates and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.	In accordance with the Surveillance Frequency Control Program

(continued)

SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.10.1.11	Verify for required SSF battery that the cell to cell and terminal connections are clean, tight and coated with anti-corrosion material.	In accordance with the Surveillance Frequency Control Program
SR 3.10.1.12	Verify battery capacity of required battery is adequate to supply, and maintain in OPERABLE status, the required maximum loads for the design duty cycle when subjected to a battery service test.	In accordance with the Surveillance Frequency Control Program
SR 3.10.1.13	Perform CHANNEL CALIBRATION for each required SSF instrument channel.	In accordance with the Surveillance Frequency Control Program
SR 3.10.1.14	Verify OPERABILITY OF SSF valves in accordance with the Inservice Testing Program.	In accordance with the Inservice Testing Program
SR 3.10.1.15	---------------------NOTE---------------------------- Not applicable to the SSF submersible pump. -- Verify the developed head of each required SSF pump at the flow test point is greater than or equal to the required developed head.	In accordance with the Inservice Testing Program
SR 3.10.1.16	Verify the developed head of the SSF submersible pump at the flow test point is greater than or equal to the required developed head.	In accordance with the Surveillance Frequency Control Program

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. Required Action and associated Completion Time of Condition A not met. <u>OR</u> Required SSF battery with average electrolyte temperature of the representative cells < 60°F. <u>OR</u> Required SSF battery with one or more battery cell parameters not within Category C values.	B.1 Declare SSF Power System inoperable.	Immediately

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.10.2.1	Verify battery cell parameters meet Table 3.10.2-1 Category A limits.	In accordance with the Surveillance Frequency Control Program
SR 3.10.2.2	Verify battery cell parameters meet Table 3.10.2-1 Category B limits.	In accordance with the Surveillance Frequency Control Program
SR 3.10.2.3	Verify average electrolyte temperature of representative cells is ≥ 60°F.	In accordance with the Surveillance Frequency Control Program

5.5 Programs and Manuals

5.5.16 Safety Function Determination Program (SFDP) (continued)

A loss of safety function exists when, assuming no concurrent single failure, a safety function assumed in the accident analysis cannot be performed. For the purpose of this program, a loss of safety function may exist when a support system is inoperable, and:

a. A required system redundant to the system(s) supported by the inoperable support system is also inoperable; or

b. A required system redundant to the system(s) in turn supported by the inoperable supported system is also inoperable; or

c. A required system redundant to the support system(s) for the supported systems (a) and (b) above is also inoperable.

The SFDP identifies where a loss of safety function exists. If a loss of safety function is determined to exist by this program, the appropriate Conditions and Required Actions of the LCO in which the loss of safety function exists are required to be entered.

5.5.17 Backup Method for Determining Subcooling Margin

This program ensures the capability to accurately monitor the Reactor Coolant System Subcooling Margin. The program shall include the following:

a. Training of personnel, and

b. Procedures for monitoring.

5.5.18 KHU Commercial Power Generation Testing Program

The KHU Commercial Power Generation Testing Program shall include the following and shall be met during periods of KHU commercial power generation:

a. Verify upon an actual or simulated actuation signal, each KHU's overhead tie breaker and underground tie breaker actuate to the correct position from an initial condition of commercial power generation in accordance with the Surveillance Frequency Control Program.

b. Verify upon an actual or simulated actuation signal, each KHU's frequency is $\leq$ 66 Hz in $\leq$ 23 seconds from an initial condition of commercial power generation in accordance with the Surveillance Frequency Control Program.

5.5 Programs and Manuals

5.5.18 KHU Commercial Power Generation Testing Program (continued)

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the KHU Commercial Power Generation Testing Program surveillance frequencies.

5.5.19 Lee Combustion Turbine Testing Program

The Lee Combustion Turbine (LCT) Testing program shall include the following and shall be met when a LCT is used to comply with Required Actions of Specification 3.8.1, "AC Sources-Operating" or as a emergency power source as allowed by LCO 3.8.2, "AC Sources-Shutdown":

a. Verify an LCT can energize both standby buses using 100kV line electrically separated from system grid and offsite loads in accordance with the Surveillance Frequency Control Program.

b. Verify an LCT can supply equivalent of one Unit's Loss of Coolant Accident (LOCA) loads plus two Unit's Loss of Offsite Power (LOOP) loads when connected to system grid in accordance with the Surveillance Frequency Control Program.

c. Verify an LCT can provide equivalent of one Unit's LOCA loads within one hour through 100kV line electrically separated from system grid and offsite loads in accordance with the Surveillance Frequency Control Program.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Lee Combustion Turbine Testing Program surveillance frequencies.

5.5.20 Battery Discharge Testing Program

The Battery Discharge Testing Program shall include the following and shall be met for batteries used to comply with LCO 3.8.3, "DC Sources Operating."

a. Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test in accordance with the Surveillance Frequency Control Program. This frequency shall be reduced to 12 months when battery shows degradation, or has reached 90% of the expected life with capacity < 100% of manufacturer's rating, and 24 months when battery has reached 90% of the expected life with capacity ≥ 100% of manufacturer's rating.

5.5 Programs and Manuals

5.5.20 Battery Discharge Testing Program (continued)

b. If battery capacity is determined to be < 80% of the manufacturer's rating an OPERABILITY evaluation shall be initiated immediately and completed within the guidelines of the Oconee OPERABILITY program. If the OPERABILITY evaluation determines the battery OPERABLE, battery capacity shall be restored to ≥ 80% of the manufacturer's rating within a time frame commensurate with the safety significance of the issue. Otherwise, the battery shall be declared inoperable and the applicable Condition of Specification 3.8.3 shall be entered.

The provisions of SR 3.0.2 and SR 3.0.3 are applicable to the Battery Discharge Testing Program surveillance frequencies.

5.5.21 Surveillance Frequency Control Program

This program provides controls for Surveillance Frequencies. The program shall ensure that Surveillance Requirements specified in the Technical Specifications are performed at intervals sufficient to assure the associated Limiting Conditions for Operation are met.

a. The Surveillance Frequency Control Program shall contain a list of Frequencies of those Surveillance Requirements for which the Frequency is controlled by the program.

b. Changes to the Frequencies listed in the Surveillance Frequency Control Program shall be made in accordance with NEI 04-10, "Risk-Informed Method for Control of Surveillance Frequencies," Revision 1.

c. The provisions of Surveillance Requirements 3.0.2 and 3.0.3 are applicable to the Frequencies established in the Surveillance Frequency Control Program.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.1.1

The SDM is verified by performing a reactivity balance calculation, considering the listed reactivity effects:

a. RCS boron concentration;

b. CONTROL ROD position;

c. RCS average temperature;

d. Fuel burnup;

e. Xenon concentration;

f. Samarium concentration; and

g. Overall temperature coefficient.

Operators verify that the existing boron concentration in the RCS meets SDM requirements using a SDM curve.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 3.1.

2. UFSAR, Chapter 15.

3. UFSAR, Section 15.12.

4. 10 CFR 50.36.

5. 10 CFR 100, "Reactor Site Criteria."

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.1.2.1

Core reactivity is verified by periodic reactivity balance calculations that compares the predicted core reactivity to the actual core reactivity condition (net reactivity of zero condition). The comparison is made considering that other core conditions are fixed or stable, including CONTROL ROD and APSR positions, moderator temperature, fuel temperature, fuel depletion, xenon concentration, and samarium concentration. The Surveillance is performed once prior to entering MODE 1, after each fuel loading as an initial check on core reactivity conditions and design calculations at BOC. A Note is included in the SR to indicate that the normalization of predicted core reactivity to the measured value may take place within the first 60 effective full power days (EFPD) after each fuel loading. The 60 EFPD after entering MODE 1 allows sufficient time for core conditions to reach steady state but prevents operation for a large fraction of the fuel cycle without establishing a benchmark for the design calculations. The subsequent Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 3.1.
2. UFSAR, Chapter 15.
3. 10 CFR 50.36.

BASES

ACTIONS

D.2 (continued)

The allowed Completion Time is reasonable, based on operating experience, for reaching MODE 3 from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.4.1

Verification that individual CONTROL RODS are aligned within 6.5% of their group average height limits allows the operator to detect a rod that is beginning to deviate from its expected position. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.1.4.2

Verifying each CONTROL ROD is OPERABLE would require that each rod be tripped. However, in MODES 1 and 2, tripping each CONTROL ROD could result in radial tilts. Exercising each individual CONTROL ROD provides increased confidence that all rods continue to be OPERABLE without exceeding the alignment limit, even if they are not regularly tripped. Moving each CONTROL ROD by an amount in any direction sufficient to demonstrate the absence of mechanical binding will not cause radial or axial power tilts, or oscillations, to occur. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. Between required performances of SR 3.1.4.2 (determination of CONTROL ROD OPERABILITY by movement), if a CONTROL ROD(S) is discovered to be immovable, but is determined to be trippable and aligned, the CONTROL ROD(S) is considered to be OPERABLE. At any time, if a CONTROL ROD(S) is immovable, a determination of the trippability (OPERABILITY) of the CONTROL ROD(S) must be made, and appropriate action taken.

SR 3.1.4.3

Verification of CONTROL ROD drop time allows the operator to determine that the maximum CONTROL ROD drop time permitted is consistent with the assumed CONTROL ROD drop time used in the safety analysis. The

BASES

ACTIONS

B.1.1 and B.1.2 (continued)

In this situation, SDM verification must include the worth of the untrippable rod(s) as well as the CONTROL ROD of maximum worth.

B.2

If more than one safety rod is not fully withdrawn the unit must be brought to a MODE where the LCO is not applicable. The allowed Completion Time of 12 hours is reasonable, based on operating experience, for reaching the required MODE from RTP in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.1.5.1

Verification that each safety rod is fully withdrawn ensures the safety rods are available to provide reactor shutdown capability.

Verification that individual safety rod positions are fully withdrawn allows the operator to detect a safety rod beginning to deviate from its expected position. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 3.1.
2. 10 CFR 50.46.
3. UFSAR, Chapter 3.
4. 10 CFR 50.36.

BASES

ACTIONS

A.1 (continued)

For Unit(s) with the CRDCS digital upgrade not complete, an alternative to realigning a single inoperable or misaligned APSR to the group average position is to align the remainder of the APSR group to the position of the inoperable or misaligned APSR. This restores the alignment requirements. Deviations up to 2 hours will not cause significant xenon redistribution to occur.

The reactor may continue in operation with the APSR inoperable or misaligned if the limits on AXIAL POWER IMBALANCE are surveilled within 2 hours to determine if the AXIAL POWER IMBALANCE is still within limits. Also, since any additional movement of the APSRs may result in additional imbalance, Required Action A.1 also requires the AXIAL POWER IMBALANCE surveillance to be performed again within 2 hours after each APSR movement. The required Completion Time of up to 2 hours will not cause significant xenon redistribution to occur.

B.1

The unit must be brought to a MODE in which the LCO does not apply if the Required Actions and associated Completion Times cannot be met. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours. The Completion Time of 12 hours is reasonable, based on operating experience, for reaching MODE 3 from RTP in an orderly manner and without challenging unit systems. In MODE 3, APSR alignment limits are not required because the reactor is not generating significant THERMAL POWER and excessive local LHRs cannot occur from APSR misalignment.

SURVEILLANCE REQUIREMENTS

SR 3.1.6.1

Verification that individual APSR positions are within 6.5% of the group average height limits allows the operator to detect an APSR beginning to deviate from its expected position. In addition, APSR position is continuously available to the operator in the control room so that during actual APSR motion, deviations can immediately be detected. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES (continued)

ACTIONS

A.1 (continued)

Completion Time for declaring the rod(s) inoperable is immediately. Therefore, LCO 3.1.4 or LCO 3.1.6 is entered immediately, and the required Completion Times for the appropriate Required Actions in those LCOs apply without delay.

SURVEILLANCE REQUIREMENTS

SR 3.1.7.1

A CHANNEL CHECK of the required position indication channel ensures that position indication for each CONTROL ROD and APSR remains OPERABLE and accurate. This CHANNEL CHECK will detect gross failures. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 3.1.
2. UFSAR, Chapter 15.
3. 10 CFR 50.36.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.1.8.2

The SDM is verified by performing a reactivity balance calculation, considering the following reactivity effects:

a. RCS boron concentration;

b. CONTROL ROD position;

c. RCS average temperature;

d. Fuel burnup;

e. Xenon concentration; and

f. Moderator temperature coefficient (MTC).

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix B, Section XI.

2. 10 CFR 50.59.

3. UFSAR, Section 4.3.4.

4. UFSAR, Sections 14.3, 14.4 and 14.6.

5. UFSAR, Section 14.4, Table 14-2.

6. 10 CFR 50.36.

BASES

ACTIONS (continued)

C.1

If the Required Action and associated Completion Time of Condition A or B are not met, then the reactor must be placed in MODE 3, a MODE in which this LCO does not apply. This Action ensures that the reactor does not continue operating in violation of the peaking limits, the ejected rod worth, the reactivity insertion rate assumed as initial conditions in the accident analyses, or the required minimum SDM assumed in the accident analyses. The required Completion Time of 12 hours is reasonable, based on operating experience regarding the amount of time required to reach MODE 3 from RTP without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.2.1.1

This Surveillance ensures that the sequence and overlap limits are not violated. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.2.1.2

Verification of the regulating rod position limits as specified in the COLR is sufficient to detect whether the regulating rod groups may be approaching or exceeding their group position limits. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.2.1.3

Prior to achieving criticality, an estimated critical position for the CONTROL RODS is determined. Verification that SDM meets the minimum requirements ensures that sufficient SDM capability exists with the CONTROL RODS at the estimated critical position if it is necessary to shut down or trip the reactor after criticality. The Frequency of 4 hours prior to criticality provides sufficient time to verify SDM capability and establish the estimated critical position.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.2.2.1

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.46.
2. 10 CFR 50.36.
3. SLC 16.7.8, Incore Instrumentation

BASES

SURVEILLANCE REQUIREMENTS (continued)

Backup Detector System consist of OPERABLE (Reference 4) Incore detectors configured as follows:

a. Two sets of four detectors shall lie in each core half. Each set of detectors shall lie in the same axial plane. The two sets in the same core half may lie in the same axial plane.

b. Detectors in the same plane shall have quarter core radial symmetry.Figure B 3.2.3-1 (Backup Incore Detector System for QPT Measurement) depicts an example of this configuration.

The Excore Detector System consists of four detectors (one located outside each quadrant of the core). Each detector consists functionally of two six-foot uncompensated ion chambers adjacent to the top and bottom halves of the core.

SR 3.2.3.1

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

Following restoration of the QPT to within the steady state limit, operation at ≥ 95% RTP may proceed provided the QPT is determined to remain within the steady state limit at the increased THERMAL POWER level. In case QPT exceeds the steady state limit for more than 24 hours or exceeds the transient limit (Condition A, B, or D), the potential for xenon redistribution is greater. Therefore, the QPT is monitored for 12 consecutive hourly intervals to determine whether the period of any oscillation due to xenon redistribution causes the QPT to exceed the steady state limit again.

REFERENCES

1. 10 CFR 50.46.
2. BAW 10122A, "Normal Operating Controls," Rev. 1, May 1984.
3. 10 CFR 50.36.
4. SLC 16.7.8, Incore Instrumentation

BASES

ACTIONS

D.1 (continued)

required to be OPERABLE. To achieve this status, all CRD trip breakers must be opened. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to open CRD trip breakers without challenging unit systems.

E.1

If the Required Action and associated Completion Time of Condition A are not met and Table 3.3.1-1 directs entry into Condition E, the unit must be brought to a MODE in which the specified RPS trip Function is not required to be OPERABLE. To achieve this status, THERMAL POWER must be reduced < 30% RTP. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to reach 30% RTP from full power conditions in an orderly manner without challenging unit systems.

F.1

If the Required Action and associated Completion Time of Condition A are not met and Table 3.3.1-1 directs entry into Condition F, the unit must be brought to a MODE in which the specified RPS trip Function is not required to be OPERABLE. To achieve this status, THERMAL POWER must be reduced < 2% RTP. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach 2% RTP from full power conditions in an orderly manner without challenging unit systems.

SURVEILLANCE REQUIREMENTS

The SRs for each RPS Function are identified by the SRs column of Table 3.3.1-1 for that Function. Most Functions are subject to CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION testing.

The SRs are modified by a Note. The Note directs the reader to Table 3.3.1-1 to determine the correct SRs to perform for each RPS Function.

SR 3.3.1.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. *For Unit(s) with the digital RPS complete, the CHANNEL CHECK requirement is met automatically. The digital RPS provides continuous online automatic monitoring of each of the input signals in each channel, performs signal online validation*

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.1 (continued)

against required acceptance criteria, and provides hardware functional validation. If any protective channel input signal is identified to be in the failure status, this condition is alarmed on the Unit Statalarm and input to the plant OAC. Immediate notification of the failure status is provided to the Operations staff.

A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. **For Unit(s) with the RPS digital upgrade not complete, if the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Off scale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.**

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal but more frequent checks of channel OPERABILITY during normal operational use of the displays associated with the LCO's required channels.

For Functions that trip on a combination of several measurements, such as the Nuclear Overpower Flux/Flow Imbalance Function, the CHANNEL CHECK must be performed on each input.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.2

This SR is the performance of a heat balance calibration for the power range channels when reactor power is > 15% RTP. The heat balance calibration consists of a comparison of the results of the calorimetric with the power range channel output. The outputs of the power range channels are normalized to the calorimetric. If the calorimetric exceeds the Nuclear Instrumentation System (NIS) channel output by ≥ 2% RTP, the NIS is not declared inoperable but must be adjusted. If the NIS channel cannot be properly adjusted, the channel is declared inoperable. A Note clarifies that this Surveillance is required to be performed only if reactor power is ≥ 15% RTP and that 24 hours is allowed for performing the first Surveillance after reaching 15% RTP. At lower power levels, calorimetric data are less accurate.

The power range channel's output shall be adjusted consistent with the calorimetric results if the calorimetric exceeds the power range channel's output by ≥ 2% RTP. The value of 2% is adequate because this value is assumed in the safety analyses of UFSAR, Chapter 15 (Ref. 2). These checks and, if necessary, the adjustment of the power range channels ensure that channel accuracy is maintained within the analyzed error margins. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.3

A comparison of power range nuclear instrumentation channels against incore detectors shall be performed when reactor power is ≥ 15% RTP. A Note clarifies that 24 hours is allowed for performing the first Surveillance after reaching 15% RTP. If the absolute value of imbalance error is ≥ 2% RTP, the power range channel is not inoperable, but an adjustment of the measured imbalance to agree with the incore measurements is necessary. The Imbalance error calculation is adjusted for conservatism by applying a correlation slope (CS) value to the error calculation formula. This ensures that the value of the API_O is > API_I. The CS value is listed in the COLR and is cycle dependent. If the power range channel cannot be properly recalibrated, the channel is declared inoperable. The calculation of the Allowable Value envelope assumes a difference in out of core to incore measurements of 2.0%. Additional inaccuracies beyond those that are measured are also included in the setpoint envelope calculation. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.4

The SR is modified by a Note indicating that it is not applicable to Unit(s) with the RPS digital upgrade complete.

A CHANNEL FUNCTIONAL TEST is performed on each required RPS channel to ensure that the entire channel will perform the intended function. Setpoints must be found within the Allowable Values specified in Table 3.3.1-1. Any setpoint adjustment shall be consistent with the assumptions of the current uncertainty analysis.

The as found and as left values must also be recorded and reviewed for consistency with the assumptions of the surveillance interval extension analysis. The requirements for this review are outlined in BAW-10167 (Ref. 6).

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.5

The SR is modified by a Note indicating that it is only applicable to Unit(s) with the RPS digital upgrade complete. This SR manually verifies that the software setpoints are correct. The proper functioning of the processor portion of the channel is continuously checked by an automatic cyclic self monitoring.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.1.6

The SR is modified by a Note indicating that it is only applicable to Unit(s) with the RPS digital upgrade complete. This SR requires manual actuation of the output channel interposing relays to demonstrate OPERABILITY of the relays. The proper functioning of the processor portion of the channel is continuously checked by an automatic cyclic self monitoring.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.1.7

A Note to the Surveillance indicates that neutron detectors are excluded from CHANNEL CALIBRATION. This Note is necessary because of the difficulty in generating an appropriate detector input signal. Excluding the detectors is acceptable because the principles of detector operation ensure virtually instantaneous response.

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and **bistable** *(or processor output trip device for Unit(s) with the RPS digital upgrade complete)* setpoint errors are within the assumptions of the uncertainty analysis. Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the resistance temperature detectors (RTD) sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

Since the CHANNEL FUNCTIONAL TEST is a part of the CHANNEL CALIBRATION a separate SR is not retained. The digital RPS software performs a continuous online automated cross channel check, separately for each channel, and continuous online signal error detection and validation. The protection system also performs continuous online hardware monitoring. The CHANNEL FUNCTIONAL TEST essentially validates the self monitoring function and checks for a small set of failure modes that are undetectable by the self monitoring function.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.1.7 (continued)

For Unit(s) with the RPS digital upgrade complete, the digital processors shall be rebooted as part of the calibration. This verifies that the software and setpoints have not changed.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapter 7.
2. UFSAR, Chapter 15.
3. 10 CFR 50.49.
4. EDM-102, "Instrument Setpoint/Uncertainty Calculations."
5. NUREG-0737, "Clarification of TMI Action Plan Requirements," November 1979.
6. BAW-10167, May 1986.
7. 10 CFR 50.36.

BASES

ACTIONS (continued)

B.1, B.2.1, and B.2.2

Condition B applies if two or more RTCs are inoperable or if the Required Action and associated Completion Time of Condition A are not met in MODE 1, 2, or 3. In this case, the unit must be placed in a MODE in which the LCO does not apply. This is done by placing the unit in at least MODE 3 with all CRD trip breakers open or with power from all CRD trip breakers removed within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems.

C.1 and C.2

Condition C applies if two or more RTCs are inoperable or if the Required Action and associated Completion Time of Condition A are not met in MODE 4 or 5. In this case, the unit must be placed in a MODE in which the LCO does not apply. This is done by opening all CRD trip breakers or removing power from all CRD trip breakers. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to open all CRD trip breakers or remove power from all CRD trip breakers without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.3.1

The SRs include performance of a CHANNEL FUNCTIONAL TEST. This test shall verify the OPERABILITY of the RTC and its ability to receive and properly respond to channel trip and reactor trip signals.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This testing is normally performed on a rotational basis. Testing in this manner reduces the likelihood of the same systematic test errors being introduced into each redundant RTC.

BASES

ACTIONS (continued)

C.1, C.2.1, and C.2.2

With the Required Action and associated Completion Time of Condition A or B not met in MODE 1, 2, or 3, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to MODE 3, with all CRD trip breakers open or with power from all CRD trip breakers removed within 12 hours. The allowed Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems.

D.1 and D.2

With the Required Action and associated Completion Time of Condition A or B not met in MODE 4 or 5, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, all CRD trip breakers must be opened or power from all CRD trip breakers removed within 6 hours. The allowed Completion Time of 6 hours is reasonable, based on operating experience, to open all CRD trip breakers or remove power from all CRD trip breakers without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.4.1

SR 3.3.4.1 is to perform a CHANNEL FUNCTIONAL TEST. This test verifies the OPERABILITY of the trip devices by actuation of the end devices. Also, this test independently verifies the undervoltage and shunt trip mechanisms of the trip breakers. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapter 7.
2. 10 CFR 50.36.

BASES

SURVEILLANCE REQUIREMENTS

The ESPS Parameters listed in Table 3.3.5–1 are subject to CHANNEL CHECK, CHANNEL FUNCTIONAL TEST, and CHANNEL CALIBRATION. The operational bypasses associated with each RCS Pressure ESPS instrumentation channel are also subject to these SRs to ensure OPERABILITY of the ESPS instrumentation channel.

SR 3.3.5.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. *For Unit(s) with the digital ESPS complete, the CHANNEL CHECK requirement is met automatically. The digital ESPS provides continuous online automatic monitoring of each of the input signals in each channel, performs signal online validation against required acceptance criteria, and provides hardware functional validation. If any protective channel input signal is identified to be in the failure status, this condition is alarmed on the Unit Statalarm and input to the plant OAC. Immediate notification of the failure status is provided to the Operations staff.*

A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that input instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two input instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined, based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.5.1 (continued)

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but potentially more frequent, checks of channel operability during normal operational use of the displays associated with the LCO's required channels.

SR 3.3.5.2

The SR is modified by a Note indicating that it is only applicable to Unit(s) with the ESPS digital upgrade complete. This SR manually verifies that the software setpoints are correct. The proper functioning of the processor portion of the channel is continuously checked by automatic cyclic self monitoring.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.5.3

The SR is modified by a Note indicating that it is not applicable to Unit(s) with the ESPS digital upgrade complete.

A CHANNEL FUNCTIONAL TEST is performed on each required ESPS input channel to ensure the entire channel, including the bypass function, will perform the intended functions. Any setpoint adjustment shall be consistent with the assumptions of the current unit specific uncertainty analysis.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.5.4

CHANNEL CALIBRATION is a complete check of the input instrument channel, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION assures that measurement errors and **bistable** *(or processor output trip device for Unit(s) with the ESPS digital upgrade complete)* setpoint errors are within the assumptions of the unit specific uncertainty analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the uncertainty analysis.

Since the CHANNEL FUNCTIONAL TEST is a part of the CHANNEL CALIBRATION a separate SR is not retained. The digital RPS software performs a continuous online automated cross channel check, separately for each channel, and continuous online signal error detection and validation. The protection system also performs continuous online hardware monitoring. The CHANNEL FUNCTIONAL TEST essentially validates the self monitoring function and checks for a small set of failure modes that are undetectable by the self monitoring function.

For Unit(s) with the ESPS digital upgrade complete, the digital processors shall be rebooted as part of the calibration. This verifies that the software and setpoints have not changed.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapter 7.
2. 10 CFR 50.49.
3. EDM-102, "Instrument Setpoint/Uncertainty Calculations."
4. UFSAR, Chapter 15.
5. 10 CFR 50.36.

BASES

ACTIONS

B.1 and B.2 (continued)

With the Required Action and associated Completion Time not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required MODES from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.6.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST of the ESPS manual initiation. This test verifies that the initiating circuitry is OPERABLE and will actuate the automatic actuation output logic channels The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.36.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.7.1

The SR is modified by a Note indicating that it is only applicable to Unit(s) with the ESPS digital upgrade complete. This SR requires manual actuation of the output channel interposing relays to demonstrate OPERABILITY of the relays. The proper functioning of the processor portion of the channel is continuously checked by automatic cyclic self monitoring.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.7.2

SR 3.3.7.2 is the performance of a CHANNEL FUNCTIONAL TEST. *For Unit(s) with the ESPS digital upgrade complete, the digital processors shall be rebooted as part of the functional test. This verifies that the software and setpoints have not changed.*

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

The digital ESPS software performs a continuous online automated cross channel check, separately for each channel, and continuous online signal error detection and validation. The protection system also performs continual online hardware monitoring. The CHANNEL FUNCTIONAL TEST essentially validates the self monitoring function and checks for a small set of failure modes that are undetectable by the self monitoring function.

REFERENCES

1. 10 CFR 50.46.
2. UFSAR, Chapter 15.
3. 10 CFR 50.36.

BASES (continued)

SURVEILLANCE REQUIREMENTS

As noted at the beginning of the SRs, the SRs apply to each PAM instrumentation Function in Table 3.3.8-1 except where indicated.

SR 3.3.8.1

Performance of the CHANNEL CHECK for each required instrumentation channel that is normally energized ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel with a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key to verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION. The high radiation instrumentation should be compared with similar unit instruments located throughout the unit. If the radiation monitor uses keep alive sources or check sources OPERABLE from the control room, the CHANNEL CHECK should also note the detector's response to these sources.

Agreement criteria are based on a combination of the channel instrument uncertainties, including indication and readability. If a channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Offscale low current loop channels are, where practical, verified to be reading at the bottom of the range and not failed downscale.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal but more frequent checks of channels during normal operational use of the displays associated with this LCO's required channels.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.8.2 and SR 3.3.8.3

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. This test verifies the channel responds to measured parameters within the necessary range and accuracy. Note 1 to SR 3.3.8.3 clarifies that the neutron detectors are not required to be tested as part of the CHANNEL CALIBRATION. There is no adjustment that can be made to the detectors. Furthermore, adjustment of the detectors is unnecessary because they are passive devices, with minimal drift. Slow changes in detector sensitivity are compensated for by performing the daily calorimetric calibration and the monthly axial channel calibration.

For the Containment Area Radiation instrumentation, a CHANNEL CALIBRATION may consist of an electronic calibration of the channel, not including the detector, for range decades above 10 R/hr, and a one point calibration check of the detector below 10 R/hr with a gamma source.

Whenever a sensing element is replaced, the next required CHANNEL CALIBRATION of the resistance temperature detectors (RTD)sensors or Core Exit thermocouple sensors is accomplished by an inplace cross calibration that compares the other sensing elements with the recently installed sensing element.

SR 3.3.8.2 is modified by a Note indicating that it is applicable only to Functions 7 and 22. SR 3.3.8.3 is modified by Note 2 indicating that it is not applicable to Functions 7 and 22. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. Duke Power Company letter from Hal B. Tucker to Harold M. Denton (NRC) dated September 28, 1984.

2. UFSAR, Section 7.5.

3. NRC Letter from Helen N. Pastis to H. B. Tucker, "Emergency Response Capability - Conformance to Regulatory Guide 1.97," dated March 15, 1988.

4. Regulatory Guide 1.97, "Instrumentation for Light Water Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," Revision 3, May 1983.

BASES

ACTIONS

B.1, B.2, B.3, and B.4 (continued)

Action B.1, Required Action B.2, and Required Action B.3 preclude rapid positive reactivity additions. The 1 hour Completion Time for Required Action B.3 and Required Action B.4 provides sufficient time for operators to accomplish the actions. The 12 hour Frequency for performing the SDM verification provides reasonable assurance that the reactivity changes possible with CONTROL RODS inserted are detected before SDM limits are challenged.

C.1

With reactor power > 4E-4% RTP in MODE 2, 3, 4, or 5 on the wide range neutron flux instrumentation, continued operation is allowed with one or more required source range neutron flux channels inoperable. The ability to continue operation is justified because the instrumentation does not provide a safety function during high power operation. However, actions are initiated within 1 hour to restore the channel(s) to OPERABLE status for future availability. The Completion Time of 1 hour is sufficient to initiate the action. The action must continue until channels are restored to OPERABLE status.

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined, based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.9.1 (continued)

the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but potentially more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO's required channels. When operating in Required Action A.1, CHANNEL CHECK is still required. However, in this condition, a redundant source range may not be available for comparison. CHANNEL CHECK may still be performed via comparison with wide range detectors, if available, and verification that the OPERABLE source range channel is energized and indicating a value consistent with current unit status.

SR 3.3.9.2

For source range neutron flux channels, CHANNEL CALIBRATION is a complete check and readjustment of the channels from the preamplifier input to the indicators. This test verifies the channel responds to measured parameters within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests.

The SR is modified by a Note excluding neutron detectors from CHANNEL CALIBRATION. It is not necessary to test the detectors because generating a meaningful test signal is difficult. The detectors are of simple construction, and any failures in the detectors will be apparent as change in channel output.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.36.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.10.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but potentially more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO's required channels.

When operating in Required Action A.1, CHANNEL CHECK is still required. However, in this condition, a redundant wide range may not be available for comparison. CHANNEL CHECK may still be performed via comparison with power or source range detectors, if available, and verification that the OPERABLE wide range channel is energized and indicates a value consistent with current unit status.

SR 3.3.10.2

For wide range neutron flux channels, CHANNEL CALIBRATION is a complete check and readjustment of the channels, from the preamplifier input to the indicators. This test verifies the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.10.2 (continued)

The SR is modified by a Note excluding neutron detectors from CHANNEL CALIBRATION. It is not necessary to test the detectors because generating a meaningful test signal is difficult. In addition, the detectors are of simple construction, and any failures in the detectors will be apparent as a change in channel output. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.10.3

SR 3.3.10.3 is the verification once each reactor startup of one decade of overlap with the source range neutron flux instrumentation. The wide range detector should be on scale and indicating ≥ 1E-8% of RTP when the source range detector is indicating ≤ 10^4 counts per second in order for the wide range detector to indicate a one decade change prior to the source range detector going off scale. This ensures a continuous source of power indication during the approach to criticality.

The test may be omitted if performed within the previous 7 days based on operating experience, which shows that source range and wide range instrument overlap does not change appreciably within this test interval.

REFERENCES

1. 10 CFR 50.36.

BASES

ACTIONS (continued)

B.1

With two channels inoperable or if the Required Action and associated Completion Time of Condition A can not be met, the channel(s) must be returned to service within 72 hours. An inoperable channel includes any channel bypassed by Condition A.

C.1 and C.2

With the Required Action and associated Completion Time of Condition B not met, the unit must be placed in MODE 3 within 12 hours and main steam header pressure must be reduced to less than 700 psig within 18 hours. The allowed Completion Time is reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.11.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL FUNCTIONAL TEST and CHANNEL CALIBRATION.

Agreement criteria are based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Off scale low current loop channels are verified, where practical, to be reading at the bottom of the range and not failed downscale.

A continuous, automatic CHANNEL CHECK function is provided by Software. If a channel is outside the criteria, then an alarm is provided to the control room. Manual performance of the CHANNEL CHECK is acceptable.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.11.1 (continued)

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The CHANNEL CHECK supplements less formal, but potentially more frequent, checks of channel OPERABILITY during normal operational use of the displays associated with the LCO required channels.

SR 3.3.11.2

A CHANNEL FUNCTIONAL TEST is performed by comparing the test input signal to the value transmitted to the Calibration and Test Computer. This enables verification of the voltage references and the signal commons. This will ensure the channel will perform its intended function.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.11.3

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The test verifies the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channels adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and setpoint errors are within the assumptions of the setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint analysis.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.36.

BASES (continued)

ACTIONS

A Note has been added to the ACTIONS indicating that a separate Condition entry is allowed for manual initiation switches associated with each SG.

A.1

With one manual initiation switch per steam generator inoperable, the manual initiation switch must be restored to OPERABLE status within 72 hours. The Completion Time of 72 hours is based on unit operating experience and administrative controls, which provide alternative means of AFIS initiation via individual component controls. The 72 hour Completion Time is consistent with the allowed outage time for the components actuated by the AFIS.

B.1

With both manual initiation switches per steam generator inoperable or the Required Action and associated Completion Time of Condition A not met, the Unit must be placed in MODE 3 within 12 hours and the main steam header pressure reduced to less than 700 psig within 18 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required MODES from full power conditions in an orderly manner and without challenging Unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.12.1

This SR requires the performance of a digital CHANNEL FUNCTIONAL TEST to ensure that the channels can perform their intended functions. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. IEEE-279-1971, April 1972.

2. 10 CFR 50.36.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.13.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST to ensure that the digital channels can perform their intended functions. The The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.36.

BASES

ACTIONS (continued)

A.1

With one or more required EFW pump initiation circuits with one LOMF channel inoperable, the channel(s) must be placed in trip within 1 hour. With the channel in trip, the resultant logic is one-out-of-one. This channel may be considered placed in trip, after tripping, by installing jumpers or by other means that assure the channel remains in the tripped condition.

B.1

With one or more EFW pump initiation circuits inoperable or the Required Action and associated Completion Time of Condition A not met, the affected EFW pump(s) must be declared inoperable immediately since the initiation function is no longer capable of performing its safety function.

SURVEILLANCE REQUIREMENTS

SR 3.3.14.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST to ensure the LOMF pump instrumentation channels can perform their intended function.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.14.2

This SR requires the performance of a CHANNEL FUNCTIONAL TEST of the manual initiation circuit. This test verifies that the initiating circuitry is OPERABLE and will actuate the emergency feedwater pumps by either starting a motor driven emergency feedwater pump or opening the steam isolation valve that isolates the supply of steam to the drive for the turbine driven emergency feedwater pump.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.3.14.3

This SR requires the performance of a CHANNEL FUNCTIONAL TEST of the automatic initiation circuit. This test verifies that the two-out-of-two logic circuit is functional. This test simulates the required inputs to the logic circuit and verifies successful operation of the automatic initiation circuit. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.14.4

CHANNEL CALIBRATION is a complete check of the instrument channel including the sensor. The test verifies the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channels adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and setpoint errors are within the assumptions of the setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint analysis.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapters 7 and 15.

2. 10 CFR 50.36.

BASES (continued)

APPLICABILITY

Both TSV Closure channels must be OPERABLE in MODES 1, 2 and 3 with any TSVs open. In these conditions when there is significant mass and energy in the RCS and steam generators, the TSV Closure function must be OPERABLE or the TSVs closed. When the TSVs are closed, they are already performing the safety function.

In MODE 4, the steam generator energy is low. Therefore, the TSV Closure channels are not required to be OPERABLE. In MODES 5 and 6, the steam generators do not contain a significant amount of energy because their temperature is below the boiling point of water; therefore, the TSV Closure channels are not required for isolation of potential high energy secondary system pipe breaks in these MODES

ACTIONS

A.1

With one or more TSV Closure channels inoperable, all TSVs must be declared inoperable. A Completion Time of 1 hour is provided to return the TSV Closure channels to OPERABLE status. The 1 hour Completion Time is sufficient time to correct minor problems.

SURVEILLANCE REQUIREMENTS

SR 3.3.15.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST to ensure that the channels can perform their intended function. This test verifies the TSV Closure automatic actuation channels are functional. This test simulates the required inputs to the logic circuit and verifies successful operation of the automatic actuation logic channels. The test need not include actuation of the end device. This is due to the risk of a unit transient caused by the closure of TSVs during testing at power. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 15.13.
2. 10 CFR 50.36.
3. 10 CFR 100.

BASES (continued)

LCO	One channel of RB Purge Isolation-High Radiation instrumentation is required to be OPERABLE. OPERABILITY of the instrumentation includes proper operation of the sample pump. This LCO addresses only the gas sampler portion of the System.
APPLICABILITY	The RB purge isolation–high radiation instrumentation shall be OPERABLE whenever movement of recently irradiated fuel assemblies within the RB is taking place. These conditions are those under which the potential for fuel damage, and thus radiation release, is the greatest. While in MODES 1, 2, 3, and 4, the Purge Valve Isolation System does not need to be OPERABLE because the purge valves are required to be sealed closed. While in MODES 5 and 6, without fuel handling involving handling recently irradiated fuel (i.e., fuel that has occupied part of a critical reactor core within the previous 72 hours) in progress, the Purge Valve Isolation System does not need to be OPERABLE because the potential for a radioactive release is minimized. The need to use the purge valves in MODES 5 and 6 is in preparation for entry. This capability is required to minimize doses for personnel entering the building and is independent of the automatic isolation capability.
ACTIONS	<u>A.1, A.2.1, and A.2.2</u> Condition A applies to failure of the high radiation purge function during movement of recently irradiated fuel assemblies within the RB. With one channel inoperable during movement of recently irradiated fuel assemblies within the RB, the RB purge valves must be closed, or movement of recently irradiated fuel assemblies within the RB must be suspended. Required Action A.1 accomplishes the function of the high radiation channel. Required Action A.2.1 and Required Action A.2.2 place the unit in a configuration in which purge isolation on high radiation is not required. The Completion Time of "Immediately" is consistent with the urgency associated with the loss of RB isolation capability under conditions in which the fuel handling accidents involving handling recently irradiated fuel are possible and the high radiation function provides the only automatic actions to mitigate radiation release.
SURVEILLANCE REQUIREMENTS	<u>SR 3.3.16.1</u> SR 3.3.16.1 is the performance of the CHANNEL CHECK for the RB purge isolation–high radiation instrumentation to ensure that a gross failure of instrumentation has not occurred. The CHANNEL CHECK is normally a comparison of the parameter indicated on the radiation monitoring

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.16.1 (continued)

instrumentation channel to a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. Performance of the CHANNEL CHECK helps to ensure that the instrumentation continues to operate properly between each CHANNEL CALIBRATION. The high radiation instrumentation should be compared to similar unit instruments located throughout the unit. If the radiation monitor uses keep alive sources or check sources OPERABLE from the control room, the CHANNEL CHECK should also note the detector's response to these sources.

Agreement criteria are based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.16.2

This SR requires the performance of a CHANNEL FUNCTIONAL TEST to ensure that the channel can perform its intended function. The frequency requires the isolation capability of the reactor building purge valves to be verified functional once each refueling outage prior to movement of recently irradiated fuel assemblies within containment. This ensures that this function is verified prior to recently irradiated fuel assembly handling within containment. This test verifies the capability of the instrumentation to provide the RB isolation.

SR 3.3.16.3

CHANNEL CALIBRATION is a complete check of the instrument loop and the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

ACTIONS

A.1 (continued)

capable of providing necessary transfer functions to ensure power is provided to the MFBs. The 24 hour Completion Time is considered appropriate based on engineering judgment, taking into consideration the time required to complete the required action.

Required Action A.1 is modified by a Note which indicates that the Completion Time is reduced when in Condition L of LCO 3.8.1. Condition L limits the Completion Time for restoring an inoperable channel to 4 hours when emergency power source(s) or offsite power source(s) are inoperable for extended time periods or for specific reasons.

B.1 and B.2

With the Required Action and associated Completion Time not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 in 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to allow for a controlled shutdown.

SURVEILLANCE REQUIREMENTS

SR 3.3.17.1

This SR requires the performance of a CHANNEL FUNCTIONAL TEST of the EPSL automatic transfer function. The ES inputs to the Load Shed and Transfer to Standby function and the Retransfer to Startup function are verified to operate properly during an automatic transfer of the Main Feeder Buses to the Startup Transformer, Standby Buses, and retransfer to the Startup Transformers. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapters 6 and 15.
2. 10 CFR 50.36.

BASES (continued)

ACTIONS (continued)

D.1

With the Required Action and associated Completion Time not met during movement of irradiated fuel assemblies, movement of fuel assemblies must be suspended immediately. Suspension does not preclude completion of actions to establish a safe conservative condition. This action minimizes the probability or the occurrence of postulated events. The Completion Time of immediately is consistent with the required times for actions requiring prompt attention

SURVEILLANCE REQUIREMENTS

SR 3.3.18.1

A CHANNEL FUNCTIONAL TEST is performed on each voltage sensing circuit channel to ensure the channel will perform its function. A circuit is defined as three channels, one for each phase. Each channel consists of components from the sensing power transformer through the circuit auxiliary relays which operate contacts in the EPSL logic and breaker trip circuits. Minimum requirements consist of individual channel relay operation causing appropriate contact responses within associated loadshed/breaker circuits, alarm activations, and proper indications for the sensing circuit control power status. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapters 6 and 15.

2. 10 CFR 50.36.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.3.19.1

A CHANNEL FUNCTIONAL TEST is performed on each DGVP voltage sensing channel and DGVP actuation logic channel to ensure the entire channel will perform its intended function. Any setpoint adjustments shall be consistent with the assumptions of the setpoint analysis. The CHANNEL FUNCTIONAL TEST of the DGVP actuation logic channels includes verifying actuation of the switchyard isolation circuitry. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.19.2

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and bistable setpoint errors are within the assumptions of the setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint analysis.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapter 8.

2. 10 CFR 50.36.

BASES

ACTIONS

B.1 (continued)

capable of providing the CT-5 DGVP function. The 72 hour completion time is based on engineering judgement taking into consideration the infrequency of actual grid system voltage degradation and the probability of an event requiring an ES actuation.

C.1 and C.2

If two or more voltage sensing relay channels or two actuation logic channels are inoperable, automatic protection from degraded grid voltage for the standby buses powered from the 100 kV transmission system is not available. Continued operation is allowed provided that the SL breakers are opened within one hour.

Additionally, with the Required Action and associated Completion Time of Condition A or B not met, the SL breakers must be opened within one hour. This arrangement provides a high degree of reliability for the emergency power system. The one hour Completion Time is based on engineering judgement taking into consideration the infrequency of actual grid system voltage degradation and the probability of an event requiring an ES actuation.

SURVEILLANCE REQUIREMENTS

SR 3.3.20.1

A CHANNEL FUNCTIONAL TEST is performed on each CT-5 DGVP voltage sensing channel and each CT-5 DGVP actuation logic channel to ensure the entire channel will perform its intended function. Any setpoint adjustments shall be consistent with the assumptions of the setpoint analysis. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.20.2

A CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to the measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.20.2 (continued)

between successive tests. CHANNEL CALIBRATION shall find that measurement errors and bistable setpoint errors are within the assumptions of the setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint analysis.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapter 8.
2. 10 CFR 50.36.

BASES

ACTIONS

B.1 and B.2 (continued)

hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to allow for a controlled shutdown.

C.1

With both channels of the Keowee Emergency Start function inoperable then both Keowee Hydro Units must be declared inoperable immediately. The appropriate Required Actions will be implemented in accordance with LCO 3.8.1, "AC Sources–Operating."

SURVEILLANCE REQUIREMENTS

SR 3.3.21.1

A CHANNEL FUNCTIONAL TEST is performed on each Keowee Emergency Start channel to ensure the channel will perform its function during an automatic transfer of the Main Feeder Buses to the Startup Transfer, Standby Buses, and retransfer to the Startup Transformers. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapters 6 and 15.
2. 10 CFR 50.36.

BASES (continued)

APPLICABILITY

The Manual Keowee Emergency Start function required to be OPERABLE in MODES 5 and 6 and during movement of irradiated fuel assemblies provides assurance that:

a. Systems needed to provide adequate coolant inventory makeup are available for the irradiated fuel assemblies;

b. Systems needed to mitigate a fuel handling accident are available;

c. Systems necessary to mitigate the effects of events that can lead to core damage during shutdown are available; and

d. Instrumentation and control capability is available for monitoring and maintaining the unit in a cold shutdown condition or refueling condition.

ACTIONS

A.1

If the required Manual Keowee Emergency Start channel is inoperable, both Keowee Hydro Units must be declared inoperable immediately. Therefore LCO 3.8.2 is entered immediately, and the required Completion Times for the appropriate Required Actions apply without delay.

SURVEILLANCE REQUIREMENTS

SR 3.3.22.1

A CHANNEL FUNCTIONAL TEST is performed on the required Manual Keowee Emergency Start channel to ensure the channel will perform its function. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.36.

BASES

ACTIONS (continued)

C.1 and C.2

With two or more voltage sensing channels or both actuation logic channels inoperable, automatic protection for LOOP events is no longer available. This places additional burden on the operators, even though they are still the credible resource for restoring power in a LOOP event. EPSL response from ES events are not affected. Therefore, allowable time for this condition is limited to 24 hours. The completion time is based on engineering judgement and the availability of adequate time for operator response to a LOOP.

The Condition is modified by a Note indicating that this condition may be entered independently for each set of channels associated with a main feeder bus. The Condition may also be entered independently for inoperable logic channels or inoperable voltage sensing channels. The Completion Time(s) are tracked separately from the time the Condition is entered for each.

D.1

With the Required Action and associated Completion Time not met, Required Action D.1 specifies initiation of action described in Specification 5.6.6 that requires a written report to be submitted to the NRC. This report discusses the results of the root cause evaluation of the inoperability and identifies proposed restorative actions. This action is appropriate since the MFBMP does not provide the only layer of protection in any DBE, but does provide defense-in-depth for any scenario which results in loss of power to the Main Feeder Busses. Operator actions are credited for SBO mitigation. The Completion Time of "Immediately" for Required Action D.1 ensures the requirements of Specification 5.6.6 are initiated.

SURVEILLANCE REQUIREMENTS

SR 3.3.23.1

A CHANNEL FUNCTIONAL TEST is performed on each MFBMP voltage sensing channel and MFBMP actuation logic channel to ensure the MFBMP will perform its intended function. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

ACTIONS (continued)

C.1 and C.2

If two or more required LPSW RB Waterhammer Prevention analog channel(s) or two digital logic channel(s) are inoperable or the Required Actions and associated Completion Times of Condition A or B are not met, the WPS must be configured in order to assure the Containment Integrity and Heat removal functions are maintained. To achieve this status, actions to prevent automatic closing by manually opening (remote or local) two LPSW RB Waterhammer Prevention Pneumatic Discharge Isolation valves in the same header shall be completed immediately and actions to repair the inoperable equipment shall be taken immediately. LCO 3.7.7 will also apply when the LPSW RB Waterhammer Prevention Pneumatic Discharge Isolation valves in the same header are opened.

SURVEILLANCE REQUIREMENTS

SR 3.3.27.1

Performance of the CHANNEL CHECK ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that analog instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two analog instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION.

Agreement criteria are determined, based on a combination of the channel instrument uncertainties, including isolation, indication, and readability. If a channel is outside the criteria, it may be an indication that the transmitter or the signal processing equipment has drifted outside its limit.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.3.27.1 (continued)

The CHANNEL CHECK supplements less formal, but potentially more frequent, checks of channel operability during normal operational use of the displays associated with the LCO's required channels.

SR 3.3.27.2

A CHANNEL FUNCTIONAL TEST is performed on each channel to ensure the circuitry will perform its intended function. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.27.3

A CHANNEL CALIBRATION is a complete check of the analog instrument channel, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. The CHANNEL CALIBRATION leaves the components adjusted to account for instrument drift to ensure that the circuitry remains operational between successive tests. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.36.

BASES

ACTIONS

B.1 and B.2 (continued)

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.3.28.1

A CHANNEL FUNCTIONAL TEST is performed on each LPSW Pump to ensure the auto-start circuit will perform its intended function. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.3.28.2

A CHANNEL CALIBRATION is performed to verify that the components respond to the measured parameter within the necessary range and accuracy. The CHANNEL CALIBRATION leaves the components adjusted to account for instrument drift to ensure that the auto-start circuitry remains operational between successive tests. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.36.

BASES (continued)

APPLICABILITY

In MODE 1 during steady state operation, the limits on RCS loop pressure, RCS loop average temperature, and RCS flow rate must be maintained with four pump or three pump operation in order to ensure that DNBR criteria will be met in the event of an unplanned loss of forced coolant flow or other DNB limited transient. In all other MODES the power level is low enough so that DNB is not a concern. Steady state operation, for the purposes of this specification, is defined as operation within a 4% (e.g., 88% - 92% RTP) power band for ≥ 4 hours.

ACTIONS

A.1

Loop pressure and loop average coolant temperature are controllable and measurable parameters. With one or both of these parameters not within the LCO limits, action must be taken to restore the parameters. RCS flow rate is not a controllable parameter and is not expected to vary during steady state four pump or three pump operation. However, if the flow rate is below the LCO limit, the parameter must be restored to within limits or power must be reduced as required in Required Action B.1, to restore DNBR margin and eliminate the potential for violation of the accident analysis bounds. The 2 hour Completion Time for restoration of the parameters provides sufficient time to adjust unit parameters, determine the cause for the off normal condition, and restore the readings within limits. The Completion Time is based on plant operating experience.

B.1

If the Required Action and associated Completion Time are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 2 within 12 hours. In MODE 2, the reduced power condition eliminates the potential for violation of the accident analysis bounds.

The 12 hour Completion Time is reasonable, based on operating experience, to reduce power in an orderly manner.

SURVEILLANCE REQUIREMENTS

SR 3.4.1.1

Since Required Action A.1 allows a Completion Time of 2 hours to restore parameters that are not within limits, the Surveillance Frequency for loop (hot leg) pressure is sufficient to ensure that the pressure can be

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.1.1 (continued)

restored to a normal operation, steady state condition following load changes and other expected transient operations. The RCS pressure value specified in the COLR is dependent on the number of pumps in operation and has been adjusted to account for the pressure loss difference between the core exit and the measurement location. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. A Note has been added to indicate the pressure limits for three pumps operating is applied to the loop with the highest pressure.

SR 3.4.1.2

Since Required Action A.1 allows a Completion Time of 2 hours to restore parameters that are not within limits, the Surveillance Frequency for loop average temperature is sufficient to ensure that the RCS coolant temperature can be restored to a normal operation, steady state condition following load changes and other expected transient operations. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. A Note has been added to indicate the temperature limits for three pumps operating are applied to the loop with the lowest loop average temperature for the condition in which there is a 0°F ΔTc setpoint.

SR 3.4.1.3

The Surveillance Frequency for RCS total flow rate is performed using the installed flow instrumentation. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.1.4

Measurement of RCS total flow rate by performance of a calorimetric heat balance allows the installed RCS flow instrumentation to be calibrated and verifies that the actual RCS flow is greater than or equal to the minimum required RCS flow rate specified in the COLR.

BASES

SURVEILLANCE REQUIREMENTS	SR 3.4.1.4 (continued) The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The Surveillance is modified by a Note that indicates the SR does not need to be performed until 7 days after stable thermal conditions are established at higher power levels. The Note is necessary to allow measurement of the flow rate at normal operating conditions at power in MODE 1. The Surveillance cannot be performed at low power or in MODE 2 or below because at low power the ΔT across the core may be too small to provide meaningful test results.
REFERENCES	1. UFSAR, Chapter 15. 2. 10 CFR 50.36

BASES

ACTIONS

B.1 and B.2 (continued)

Times are reasonable, based on operating experience, to reach the required MODE from full power conditions in an orderly manner and without challenging unit systems.

C.1 and C.2

Actions must be initiated immediately to correct operation outside of the P/T limits at times other than MODE 1, 2, 3, or 4, so that the RCPB is returned to a condition that has been verified acceptable by stress analysis.

The immediate Completion Time reflects the urgency of initiating action to restore the parameters to within the analyzed range. Most violations will not be severe, and the activity can be accomplished within this time in a controlled manner.

In addition to restoring operation to within limits, an evaluation is required to determine if RCS operation can continue. The evaluation must verify that the RCPB integrity remains acceptable and must be completed prior to entry into MODE 4. Several methods may be used, including comparison with pre-analyzed transients in the stress analysis, or inspection of the components.

ASME Code, Section XI, Appendix E (Ref. 6), may also be used to support the evaluation. However, its use is restricted to evaluation of the vessel beltline.

Condition C is modified by a Note requiring Required Action C.2 to be completed whenever the Condition is entered. The Note emphasizes the need to perform the evaluation of the effects of the excursion outside the allowable limits. Restoration alone, per Required Action C.1, is insufficient because higher than analyzed stresses may have occurred and may have affected RCPB integrity.

SURVEILLANCE REQUIREMENTS

SR 3.4.3.1

Verification that operation is within limits is required when RCS pressure or temperature conditions are undergoing planned changes.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

Surveillance for heatup, cooldown, or LH testing may be discontinued when the definition given in the relevant plant procedure for ending the activity is satisfied.

BASES

SURVEILLANCE REQUIREMENTS	SR 3.4.3.1 (continued) This SR is modified by a Note that requires this SR to be performed only during system heatup, cooldown, and LH testing.

REFERENCES

1. 10 CFR 50, Appendix G.
2. ASME, Boiler and Pressure Vessel Code, Section III, Appendix G.
3. Regulatory Guide 1.99, Revision 2, May 1988.
4. ASTM E 185-82, July 1982.
5. 10 CFR 50, Appendix H.
6. ASME, Boiler and Pressure Vessel Code, Section XI, Appendix E.
7. 10 CFR 50.36.
8. FTI Doc. 32-5010572-00, Allowable LPI Pressures For LPI Cooler Swap.

BASES (continued)

APPLICABILITY

In MODES 1 and 2, the reactor is critical and has the potential to produce maximum THERMAL POWER. To ensure that the assumptions of the accident analyses remain valid, all RCS loops are required to be OPERABLE and in operation in these MODES to prevent DNB and core damage.

The decay heat production rate is much lower than the full power heat rate. As such, the forced circulation flow and heat sink requirements are reduced for lower, noncritical MODES as indicated by the LCOs for MODES 3, 4, and 5.

Operation in other MODES is covered by:

LCO 3.4.5, "RCS Loops – MODE 3";
LCO 3.4.6, "RCS Loops – MODE 4";
LCO 3.4.7, "RCS Loops – MODE 5, Loops Filled";
LCO 3.4.8, "RCS Loops – MODE 5, Loops Not Filled";
LCO 3.9.4, "Decay Heat Removal (DHR) and Coolant Circulation – High Water Level" (MODE 6); and
LCO 3.9.5, "Decay Heat Removal (DHR) and Coolant Circulation – Low Water Level" (MODE 6).

ACTIONS

A.1

If the requirements of the LCO are not met, the Required Action is to reduce power and bring the unit to MODE 3. This lowers power level and thus reduces the core heat removal needs and minimizes the possibility of violating DNB limits.

The Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging safety systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.4.1

This SR requires verification of the required number of loops in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal while maintaining the margin to DNB. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.5.1

This SR requires verification that the required number of loops and pumps is in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. In addition, control room indication and alarms will normally indicate loop status.

SR 3.4.5.2

Verification that the required number of RCPs are OPERABLE ensures that an additional RCS loop can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power availability to the required pump that is not in operation. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.36.

BASES

ACTIONS

B.1 and B.2 (continued)

RCS or DHR loop to OPERABLE status and operation must be initiated. Boron dilution requires forced circulation for proper mixing, and the margin to criticality must not be reduced in this type of operation. The immediate Completion Times reflect the importance of maintaining operation for decay heat removal. The action to restore must continue until one loop is restored to operation.

SURVEILLANCE REQUIREMENTS

SR 3.4.6.1

This Surveillance requires verification of the required DHR or RCS loop in operation to ensure forced flow is providing decay heat removal. Verification includes flow rate, temperature, or pump status monitoring. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. In addition, control room indication and alarms will normally indicate loop status.

SR 3.4.6.2

Verification that the required pump is OPERABLE ensures that an additional RCS or DHR loop can be placed in operation if needed to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pumps. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.36.

BASES (continued)

APPLICABILITY (continued)

LCO 3.4.6, "RCS Loops – MODE 4";
LCO 3.4.8, "RCS Loops – MODE 5, Loops Not Filled";
LCO 3.9.4, "Decay Heat Removal (DHR) and Coolant Circulation – High Water Level" (MODE 6); and
LCO 3.9.5, "Decay Heat Removal (DHR) and Coolant Circulation – Low Water Level" (MODE 6).

ACTIONS

A.1 and A.2

If one required DHR loop is inoperable and any required SG has secondary side water level < 50%, redundancy for heat removal is lost. Action must be initiated to restore a second DHR loop to OPERABLE status or initiate action to restore the secondary side water level in the SGs, and action must be taken immediately. Either Required Action A.1 or Required Action A.2 will restore redundant decay heat removal paths. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal.

B.1 and B.2

If no required DHR loop is in operation (no DHR loop is required to be in operation provided the conditions of Note 1 are met), or no required DHR loop is OPERABLE, all operations involving the reduction of RCS boron concentration must be suspended and action to restore a DHR loop to OPERABLE status and operation must be initiated. Boron dilution requires forced circulation for proper mixing, and the margin to criticality must not be reduced in this type of operation. The immediate Completion Time reflects the importance of maintaining operation for decay heat removal.

SURVEILLANCE REQUIREMENTS

SR 3.4.7.1

This SR requires verification that the required DHR loop is in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. In addition, control room indication and alarms will normally indicate loop status.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.7.2

Verifying the SGs are OPERABLE by ensuring their secondary side water levels are ≥ 50% ensures that redundant heat removal paths are available if the second DHR loop is not OPERABLE. If both DHR loops are OPERABLE, this Surveillance is not needed. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.7.3

Verification that each required DHR pump is OPERABLE ensures that a DHR loop can be placed in operation if needed to maintain decay heat removal and reactor coolant circulation. If the secondary side water level is ≥ 50% in both SGs, this Surveillance is not needed. Verification is performed by verifying proper breaker alignment and power available to the required pumps. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.36.

BASES (continued)

APPLICABILITY (continued)

LCO 3.4.6, "RCS Loops – MODE 4";
LCO 3.4.7, "RCS Loops – MODE 5, Loops Filled";
LCO 3.9.4, "Decay Heat Removal (DHR) and Coolant Circulation – High Water Level" (MODE 6); and
LCO 3.9.5, "Decay Heat Removal (DHR) and Coolant Circulation – Low Water Level" (MODE 6).

ACTIONS

A.1

If one required DHR loop is inoperable, redundancy for heat removal is lost. Required Action A.1 is to immediately initiate activities to restore a second loop to OPERABLE status. The immediate Completion Time reflects the importance of maintaining the availability of two paths for heat removal.

B.1 and B.2

If no required loop is OPERABLE or the required loop is not in operation, (no loop is required to be in operation provided the conditions of Note 1 in the LCO are met), the Required Action requires immediate suspension of all operations involving boron reduction and requires initiation of action to immediately restore one DHR loop to OPERABLE status and operation. The Required Action for restoration does not apply to the condition of both loops not in operation when the exception Note in the LCO is in force. The immediate Completion Time reflects the importance of maintaining operations for decay heat removal. The action to restore must continue until one loop is restored.

SURVEILLANCE REQUIREMENTS

SR 3.4.8.1

This Surveillance requires verification that the required loop is in operation. Verification includes flow rate, temperature, or pump status monitoring, which help ensure that forced flow is providing heat removal. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.8.2

Verification that the required number of pumps are OPERABLE ensures that redundancy for heat removal is provided. The requirement also ensures that additional loops can be placed in operation if needed to

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.8.2 (continued)

maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pumps. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. Generic Letter 88-17, October 17, 1988.
2. 10 CFR 50.36.

BASES

ACTIONS (continued)

Twelve hours is a reasonable time based upon operating experience to reach MODE 3 from full power without challenging unit systems and operators. Further pressure and temperature reduction to MODE 3 with RCS temperature ≤ 325°F places the unit into a MODE where the LCO is not applicable. The 18 hour Completion Time to reach the nonapplicable MODE is reasonable based upon operating experience.

C.1

If the power supplies to the heaters are not capable of providing 400 kW, or the pressurizer heaters are inoperable, restoration is required in 72 hours. The Completion Time of 72 hours is reasonable considering the anticipation that a demand will not occur in this period.

D.1 and D.2

If pressurizer heater capability cannot be restored within the allowed Completion Time of Required Action C.1, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to MODE 3 within 12 hours and to MODE 3 with RCS temperature ≤ 325°F within the following 6 hours. The Completion Time of 12 hours is reasonable, based on operating experience, to reach MODE 3 from full power conditions in an orderly manner and without challenging unit systems. Similarly, the Completion Time of 18 hours to be in MODE 3 with RCS temperature ≤ 325°F is reasonable based on operating experience to achieve power reduction from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.9.1

This SR requires that during steady state operation, pressurizer water level is maintained below the nominal upper limit to provide a minimum space for a steam bubble. The Surveillance is performed by observing the indicated level. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. Alarms are also available for early detection of abnormal level indications.

SR 3.4.9.2

The SR verifies the power supplies are capable of producing the minimum power and the associated pressurizer heaters are at their design rating. (This may be done by testing the power supply output and heater current,

BASES (continued)

SURVEILLANCE REQUIREMENTS (continued)	or by performing an electrical check on heater element continuity and resistance.) The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.36.
2. NUREG-0737, November 1980.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.4.11.1

SR 3.4.11.1 requires performing a gamma isotopic analysis as a measure of the gross specific activity of the reactor coolant. While basically a quantitative measure of radionuclides with half lives longer than 30 minutes, excluding iodines, this measurement is the sum of the degassed gamma activities and the gaseous gamma activities in the sample taken. This Surveillance provides an indication of any increase in gross specific activity.

Trending the results of this Surveillance allows proper remedial action to be taken before reaching the LCO limit under normal operating conditions. The Surveillance is applicable in MODES 1 and 2, and in MODE 3 with RCS average temperature at least 500°F. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.11.2

This Surveillance is performed in MODE 1 only to ensure the iodine remains within limit during normal operation and following fast power changes when fuel failure is more apt to occur. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The Frequency, between 2 and 6 hours after a power change of ≥ 15% RTP within a 1 hour period, is established because the iodine levels peak during this time following fuel failure; samples at other times would provide inaccurate results.

SR 3.4.11.3

SR 3.4.11.3 requires radiochemical analysis for $\bar{E}$ determination with the unit operating in MODE 1 equilibrium conditions. The $\bar{E}$ determination directly relates to the LCO and is required to verify unit operation within the specific gross activity LCO limit. The analysis for $\bar{E}$ is a measurement of the average energies per disintegration for isotopes with half lives longer than 30 minutes, excluding iodines. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR has been modified by a Note that requires sampling to be performed 31 days after a minimum of 2 EFPD and 20 days of MODE 1 operation have elapsed since the reactor was last subcritical for at least 48 hours. This ensures the radioactive materials are at equilibrium so the analysis for $\bar{E}$ is representative and not skewed by a crud burst or other similar abnormal event.

BASES

ACTIONS

F.1 and G.1 (continued)

RCS vent path capable of mitigating the most limiting LTOP event must be established within 12 hours. These Completion Times also consider that these activities can be accomplished in these time periods. A limiting LTOP event is not likely in these periods.

H.1 and H.2

With administrative controls which assure ≥ 10 minutes are available to mitigate the consequences of an LTOP event not implemented and the PORV inoperable; or the LTOP System inoperable for any reason other than cited in Condition A through G, the system must be restored to OPERABLE status within one hour. When this is not possible, Required Action H.2 requires the RCS depressurized and vented within 12 hours.

One or more vents may be used. A vent path capable of mitigating the most limiting LTOP event is specified. Because makeup may be required, the vent size accommodates inadvertent full makeup system operation. Such a vent keeps the pressure from full flow of the makeup pump(s) with a wide open makeup control valve within the LCO limit.

The Completion Time is based on operating experience that these activity can be accomplished in this time period and on engineering judgement indicating that a limiting LTOP transient is not likely in this time.

SURVEILLANCE REQUIREMENTS

SR 3.4.12.1 and SR 3.4.12.2

Verifications must be performed that HPI is deactivated, and the CFTs are isolated. These Surveillances ensure the minimum coolant input capability will not create an RCS overpressure condition to challenge the LTOP System. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.12.3

Verification that the pressurizer level is less than the volume necessary to assure ≥ 10 minutes are available for operator action to mitigate an LTOP event by observing control room or other indications ensures a cushion of sufficient size is available to reduce the rate of pressure increase from potential transients.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.3 (continued)

The 30 minute Surveillance Frequency during heatup and cooldown must be performed for the LCO Applicability period when temperature changes can cause pressurizer level variations. This Frequency may be discontinued when the ends of these conditions are satisfied, as defined in plant procedures.

The subsequent Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.12.4

Verification that the PORV block valve is open ensures a flow path to the PORV.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.12.5

A CHANNEL FUNCTIONAL TEST is required periodically. PORV actuation is not needed, as it could depressurize the RCS.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.12.6

Verification that administrative controls, other than limits for pressurizer level, that assure ≥ 10 minutes are available for operator action to mitigate the consequences of an LTOP event are implemented is necessary periodically. This verification consists of a combination of administrative checks for alarm availability, verification that pressurizer heater bank 3 or 4 is deactivated, appropriate restrictions on pressurizer level, controls for High Pressure Nitrogen, etc., as well as visual confirmation using available indications that associated physical parameters are within limits.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.12.6 (continued)

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.12.7

The CHANNEL CALIBRATION for the LTOP setpoint ensures that the PORV will be actuated at the appropriate RCS pressure by verifying the accuracy of the instrument string.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix G.
2. Generic Letter 88-11.
3. UFSAR, 5.2.3.7.
4. 10 CFR 50.36.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.13.1 (continued)

Steady state operation is required to perform a proper water inventory balance since calculations during maneuvering are not useful. For RCS operational LEAKAGE determination by water inventory balance, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP pump seal injection and return flows.

An early warning of LEAKAGE is provided by the automatic systems that monitor the containment atmosphere radioactivity and the containment sump level.

These leakage detection systems are specified in LCO 3.4.15, "RCS Leakage Detection Instrumentation."

Note 2 states that this SR is not applicable to primary to secondary LEAKAGE because LEAKAGE of 150 gallons per day cannot be measured accurately by an RCS water inventory balance.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.4.13.2

This SR verifies that primary to secondary LEAKAGE is less than or equal to 150 gallons per day through any one SG. Satisfying the primary to secondary LEAKAGE limit ensures that the operational LEAKAGE performance criterion in the Steam Generator Program is met. If this SR is not met, compliance with this LCO, as well as LCO 3.4.16, "Steam Generator Tube Integrity," should be evaluated. The 150 gallons per day limit is measured at room temperature as described in Ref. 5. The operational LEAKAGE rate limit applies to LEAKAGE through any one SG. If it is not practical to assign the LEAKAGE to an individual SG, all the primary to secondary LEAKAGE should be conservatively assumed to be from one SG.

The Surveillance is modified by a Note which states that the Surveillance is not required to be performed until 12 hours after establishment of steady state operation. For RCS primary to secondary LEAKAGE determination, steady state is defined as stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.4.13.2 (continued)

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The primary to secondary LEAKAGE is determined using continuous process radiation monitors or radiochemical grab sampling in accordance with the EPRI guidelines (Ref. 5).

REFERENCES

1. UFSAR, Section 3.1.
2. UFSAR, Chapter 15.
3. 10 CFR 50.36.
4. NEI 97-06, "Steam Generator Program Guidelines."
5. EPRI, "Pressurized Water Reactor Primary-to-Secondary Leak Guidelines."

BASES

ACTIONS

A.1 and A.2 (continued)

Required Action A.2 specifies that the double isolation barrier of two valves be restored by closing some other valve qualified for isolation. The 72 hour time after exceeding the limit considers the time required to complete the Action and the low probability of a second valve failing during this time period.

B.1 and B.2

If Required Actions and associated Completion Times are not met, the unit must be brought to a MODE in which the requirement does not apply. To achieve this status, the unit must be brought to MODE 3 within 12 hours and to MODE 5 within 36 hours. This Required Action may reduce the leakage and also reduces the potential for a LOCA outside the containment. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.4.14.1

Performance of leakage testing on each required RCS PIV or isolation valve used to satisfy Required Action A.1 or A.2 is required to verify that leakage is below the specified limit and to identify each leaking valve. The leakage limit of 0.5 gpm per inch of nominal valve diameter up to 5 gpm maximum applies to each valve. Leakage testing requires a stable pressure condition.

For the two PIVs in series, the leakage requirement applies to each valve individually and not to the combined leakage across both valves. If the PIVs are not individually leakage tested, one valve may have failed completely and not detected if the other valve in series meets the leakage requirement. In this situation, the protection provided by redundant valves would be lost.

Testing is to be performed in accordance with the Surveillance Frequency Control Program and prior to entering MODE 2 whenever the unit has been in MODE 5 for ≥ 7 days, if leakage testing has not been performed in the previous 9 months. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

REFERENCES (continued)	7.	ASME, Boiler and Pressure Vessel Code, Section XI.

BASES

ACTIONS

B.1.1, B.1.2, and B.2 (continued)

The 24 hour interval for SR 3.4.13.1 provides periodic information that is adequate to detect leakage. A Note is added allowing that SR 3.4.13.1 is not required to be performed until 12 hours after steady state operation (stable RCS pressure, temperature, power level, pressurizer and makeup tank levels, makeup and letdown, and RCP seal injection and return flows). The 12 hour allowance provides sufficient time to collect and process all necessary data after stable plant conditions are established. The 30 day Completion Time recognizes at least one other form of leak detection is available.

C.1 and C.2

If a Required Action of Condition A or B cannot be met within the required Completion Time, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

D.1

If both required leakage detection instruments are inoperable, no automatic means of monitoring leakage are available, and immediate plant shutdown in accordance with LCO 3.0.3 is required.

SURVEILLANCE REQUIREMENTS

SR 3.4.15.1

SR 3.4.15.1 requires the performance of a CHANNEL CHECK of the required containment atmosphere radioactivity monitor. The check gives reasonable confidence that the channel is operating properly. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.4.15.2

SR 3.4.15.2 requires the performance of a CHANNEL FUNCTIONAL TEST of the required containment atmosphere radioactivity monitor. The test ensures that the monitor can perform its function in the desired manner. The test verifies the alarm setpoint and relative accuracy of the instrument string.

SR 3.4.15.3 and SR 3.4.15.4

These SRs require the performance of a CHANNEL CALIBRATION for each of the required RCS leakage detection instrumentation channels. The calibration verifies the accuracy of the instrument string, including the instruments located inside containment. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 3.1.
2. 10 CFR 50.36.

BASES

ACTIONS (continued)

B.1

If one CFT is inoperable for a reason other than boron concentration, the CFT must be returned to OPERABLE status within 1 hour. In this condition it cannot be assumed that the CFT will perform its required function during a LOCA. Due to the severity of the consequences should a LOCA occur in these conditions, the 1 hour Completion Time to open the valve, remove power to the valve, or restore the proper water volume or nitrogen cover pressure ensures that prompt action will be taken to return the inoperable CFT to OPERABLE status. The Completion Time minimizes the time the unit is potentially exposed to a LOCA in these conditions.

C.1 and C.2

If the Required Actions and associated Completion Times of Condition A or B are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and RCS pressure reduced to ≤ 800 psig within 18 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

D.1

If more than one CFT is inoperable, the unit is in a condition outside the accident analysis; therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.5.1.1

Verification that each CFT isolation valve is fully open ensures that the CFTs are available for injection and ensures timely discovery if a valve should be less than fully open. If an isolation valve is not fully open, the rate of injection to the RCS would be reduced. Although a motor operated valve position should not change with power removed, a closed valve could result in accident analysis assumptions not being met. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.1.2 and SR 3.5.1.3

Verification of each CFT's nitrogen cover pressure (≥ 575 psig and ≤ 625 psig) and the borated water volume (≥ 1010 ft^3 and ≤ 1070 ft^3) is sufficient to ensure adequate injection during a LOCA. A CFT level of ≥ 12.56 ft and ≤ 13.44 ft corresponds to the specified borated water volume. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.5.1.4

Surveillance is reasonable to verify that the CFT boron concentration is within the required limits, because the static design of the CFT limits the ways in which the concentration can be changed. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. Verifying CFT boron concentration within 12 hours after an 80 gallon volume increase will identify whether inleakage from the RCS has caused a reduction in boron concentration to below the required limit. The 80 gallon increase represents approximately 1% increase in volume. It is not necessary to verify boron concentration if the added water inventory is from a borated water source that meets CFT boron concentration requirements, such as the boric acid mix tank or the borated water storage tank (BWST). This is consistent with the recommendations of NUREG-1366 (Ref. 4).

SR 3.5.1.5

Verification that power is removed from each CFT isolation valve operator ensures that an active failure could not result in the undetected closure of a CFT motor operated isolation valve coincident with a LOCA. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.2.1

Verifying the correct alignment for manual and non-automatic power operated valves in the HPI flow paths provides assurance that the proper flow paths will exist for HPI operation. This SR does apply to the HPI suction header cross-connect valves, the HPI discharge cross-connect valves, the HPI discharge crossover valves, and the LPI-HPI flow path discharge valves (LP-15 and LP-16). This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. Similarly, this SR does not apply to automatic valves since automatic valves actuate to their required position upon an accident signal. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.5.2.2

With the exception of the HPI pump operating to provide normal makeup, the other two HPI pumps are normally in a standby, non-operating mode. As such, the emergency injection flow path piping has the potential to develop voids and pockets of entrained gases. Venting the HPI pump casings periodically reduces the potential that such voids and pockets of entrained gases can adversely affect operation of the HPI System. This will also reduce the potential for water hammer, pump cavitation, and pumping of noncondensible gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following an ESPS signal. This Surveillance is modified by a Note that indicates it is not applicable to operating HPI pump(s) providing normal makeup. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.5.2.3

Periodic surveillance testing of HPI pumps to detect gross degradation caused by impeller structural damage or other hydraulic component problems is required by Section XI of the ASME Code (Ref. 5). SRs are specified in the Inservice Testing Program, which encompasses Section XI of the ASME Code.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.2.4 and SR 3.5.2.5

These SRs demonstrate that each automatic HPI valve actuates to the required position on an actual or simulated ESPS signal and that each HPI pump starts on receipt of an actual or simulated ESPS signal. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. The test will be considered satisfactory if control board indication verifies that all components have responded to the ESPS actuation signal properly (all appropriate ESPS actuated pump breakers have opened or closed and all ESPS actuated valves have completed their travel). The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The actuation logic is tested as part of the ESPS testing, and equipment performance is monitored as part of the Inservice Testing Program.

SR 3.5.2.6

Periodic inspections of the reactor building sump suction inlet (for LPI-HPI flow path) ensure that it is unrestricted and stays in proper operating condition. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.5.2.7

Periodic stroke testing of the HPI discharge crossover valves (HP-409 and HP-410) and LPI-HPI flow path discharge valves (LP-15 and LP-16) is required to ensure that the valves can be manually cycled from the Control Room. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

ACTIONS

D.2 (continued)

Required Action D.2 requires that the unit be placed in MODE 5 within 24 hours. This Required Action is modified by a Note that states that the Required Action is only required to be performed if a DHR loop is OPERABLE. This Required Action provides for those circumstances where the LPI trains may be inoperable but otherwise capable of providing the necessary decay heat removal. Under this circumstance, the prudent action is to remove the unit from the Applicability of the LCO and place the unit in a stable condition in MODE 5. The Completion Time of 24 hours is reasonable, based on operating experience, to reach MODE 5 in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.5.3.1

Verifying the correct alignment for manual and non-automatic power operated valves in the LPI flow paths provides assurance that the proper flow paths will exist for LPI operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these valves were verified to be in the correct position prior to locking, sealing, or securing. Similarly, this SR does not apply to automatic valves since automatic valves actuate to their required position upon an accident signal. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of being mispositioned are in the correct position. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

When in MODE 4 an LPI train may be considered OPERABLE during alignment, when aligned or when operating for decay heat removal if capable of being manually realigned to the LPI mode of operation.

Therefore, for this condition, the SR verifies that LPI is capable of being manually realigned to the LPI mode of operation.

SR 3.5.3.2

With the exception of systems in operation, the LPI pumps are normally in a standby, non-operating mode. As such, the flow path piping has the potential to develop voids and pockets of entrained gases. Venting the LPI pump casings periodically reduces the potential that such voids and pockets of entrained gases can adversely affect operation of the LPI System. This will also minimize the potential for water hammer, pump

BASES

SURVEILLANCE REQUIREMENTS

SR 3.5.3.2 (continued)

cavitation, and pumping of noncondensible gas (e.g., air, nitrogen, or hydrogen) into the reactor vessel following an ESPS signal or during shutdown cooling. This Surveillance is modified by a Note that indicates it is not applicable to operating LPI pump(s). The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.5.3.3

Periodic surveillance testing of LPI pumps to detect gross degradation caused by impeller structural damage or other hydraulic component problems is required by Section XI of the ASME Code (Ref. 6). SRs are specified in the Inservice Testing Program, which encompasses Section XI of the ASME Code.

SR 3.5.3.4 and SR 3.5.3.5

These SRs demonstrate that each automatic LPI valve actuates to the required position on an actual or simulated ESPS signal and that each LPI pump starts on receipt of an actual or simulated ESPS signal. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. The test will be considered satisfactory if control board indication verifies that all components have responded to the ESPS actuation signal properly (all appropriate ESPS actuated pump breakers have opened or closed and all ESPS actuated valves have completed their travel). The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

The actuation logic is tested as part of the ESPS testing, and equipment performance is monitored as part of the Inservice Testing Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.3.6

Periodic inspections of the reactor building sump suction inlet ensure that it is unrestricted and stays in proper operating condition. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.46.
2. UFSAR, Section 15.14.3.3.6.
3. UFSAR, Section 15.14.3.3.5.
4. 10 CFR 50.36.
5. NRC Memorandum to V. Stello, Jr., from R.L. Baer, "Recommended Interim Revisions to LCOs for ECCS Components," December 1, 1975.
6. ASME, Boiler and Pressure Vessel Code, Section XI, Inservice Inspection, Article IWV-3400.
7. NRC Safety Evaluation of Babcock & Wilcox Owners Group (B&WOG) Topical Report BAW-2295, Revision 1, "Justification for the Extension of Allowed Outage Time for Low Pressure Injection and Reactor Building Spray systems," (TAC No. MA3807) dated June 30, 1999.

BASES

ACTIONS (continued)

B.1

With the BWST inoperable for reasons other than Condition A (e.g., water volume), the BWST must be restored to OPERABLE status within 1 hour. In this condition, neither the ECCS nor the Reactor Building Spray System can perform its design functions. Therefore, prompt action must be taken to restore the BWST to OPERABLE status or to place the unit in a MODE in which the BWST is not required. The allowed Completion Time of 1 hour to restore the BWST to OPERABLE status is based on this condition simultaneously affecting multiple redundant trains.

C.1 and C.2

If the Required Action and associated Completion Time are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.5.4.1

Verification that the BWST water temperature is within the specified temperature band ensures that the fluid will not freeze and that the fluid temperature entering the reactor vessel will not be colder than assumed in the reactor vessel stress analysis; and the fluid temperature entering the reactor vessel will not be hotter than assumed in the LOCA analysis. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

The SR is modified by a Note that requires the Surveillance to be performed only when ambient air temperatures are outside the operating temperature limits of the BWST. With ambient temperature within this band, the BWST temperature should not exceed the limits.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.5.4.2

Verification that the BWST contained volume is ≥ 350,000 gallons (46.0 ft.) ensures that a sufficient initial supply is available for injection and to support continued ECCS pump operation on recirculation. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.5.4.3

Verification that the boron concentration of the BWST fluid is within the required band ensures that the reactor will remain subcritical following a LOCA. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The COLR revision process assures that the minimum boron concentration specified in the COLR bounds the limit specified by this SR.

REFERENCES

1. 10 CFR 50.36.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.2.2 (continued)

the interlock will function as designed and that simultaneous opening of the inner and outer doors will not inadvertently occur The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50, Appendix J, Option A and B.
2. UFSAR, Section 15.14.
3. UFSAR, Section 6.2.
4. 10 CFR 50.36.
5. Duke Power Company letter from William O. Parker, Jr. to Harold R. Denton (NRC) dated July 24, 1981.
6. NRC Letter from Philip C. Wagner to William O. Parker, Jr., dated November 6, 1981, Issuance of Amendment 104, 104 and 101 to Licenses DPR-38, DPR-47 and DPR-55 for the Oconee Nuclear Station Units Nos 1, 2 and 3.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.6.3.1

Each 48 inch reactor building purge valve is required to be periodically verified sealed closed. This Surveillance is designed to ensure that a gross breach of containment is not caused by an inadvertent or spurious opening of a reactor building purge valve. Detailed analysis of the purge valves failed to conclusively demonstrate their ability to close during a LOCA in time to limit offsite doses. Therefore, these valves are required to be in the sealed closed position during MODES 1, 2, 3, and 4. A reactor building purge valve that is sealed closed must have motive power to the valve operator removed. This can be accomplished by de-energizing the source of electric power or by removing the air supply to the valve operator.

In this application, the term "sealed" has no connotation of leak tightness. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.6.3.2

This SR requires verification that each containment isolation manual and non-automatic power operated valve and blind flange located outside containment and not locked, sealed, or otherwise secured, and required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside the containment boundary is within design limits. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those containment isolation valves outside containment and capable of being mispositioned are in the correct position. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The SR specifies that containment isolation valves open under administrative controls are not required to meet the SR during the time the valves are open. The opening of locked or sealed closed containment isolation valves on an intermittent basis under administrative control includes the following: (1) stationing an operator, who is in constant communication with control room, at the valve controls, (2) instructing this operator to close these valves in an accident situation, and (3) assuring that environmental conditions will not preclude access to close the valves and that this action will prevent the release of radioactivity outside the containment (Ref. 5). The dedicated individual can be responsible for closing more than one valve provided that the valves are all in close vicinity and can be closed in a timely manner. This SR does not apply to valves that are locked, sealed, or otherwise secured, since these were verified to be in the correct position upon locking, sealing, or securing.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.3.2 (continued)

The Note applies to valves and blind flanges located in high radiation areas and allows these devices to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since access to these areas is typically restricted during MODES 1, 2, 3, and 4 for ALARA reasons. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in the proper position, is low.

SR 3.6.3.3

This SR requires verification that each containment isolation manual and non-automatic power operated valve and blind flange that is located inside containment and not locked, sealed, or otherwise secured, and required to be closed during accident conditions is closed. The SR helps to ensure that post accident leakage of radioactive fluids or gases outside the

containment boundary is within design limits. For containment isolation valves inside containment, the Frequency of "prior to entering MODE 4 from MODE 5 if not performed within the previous 92 days" is appropriate, since these containment isolation valves are operated under administrative controls and the probability of their misalignment is low. The SR specifies that containment isolation valves open under administrative controls are not required to meet the SR during the time they are open. The opening of locked or sealed closed containment isolation valves on an intermittent basis under administrative control includes the following considerations: (1) stationing an operator, who is in constant communication with the control room, at the valve controls, (2) instructing this operator to close these valves in an accident situation, and (3) assuring that environmental conditions will not preclude access to close the valves and that this action will prevent the release of radioactivity outside the containment (Ref. 5). The dedicated individual can be responsible for closing more than one valve provided that the valves are all in close vicinity and can be closed in a timely manner. This SR does not apply to valves that are locked, sealed, or otherwise secured, since these were verified to be in the correct position upon locking, sealing, or securing.

The Note allows valves and blind flanges located in high radiation areas to be verified closed by use of administrative means. Allowing verification by administrative means is considered acceptable, since the access to these areas is typically restricted during MODES 1, 2, 3, and 4 for ALARA reasons. Therefore, the probability of misalignment of these containment isolation valves, once they have been verified to be in their proper position,

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.3.4

Verifying that the isolation time of each automatic power operated containment isolation valve is within limits is required to demonstrate OPERABILITY. The isolation time and Frequency of this SR are in accordance with the Inservice Testing Program.

SR 3.6.3.5

Automatic containment isolation valves close on a containment isolation signal to prevent leakage of radioactive material from containment following an accident. This SR ensures that each automatic containment isolation valve will actuate to its isolation position on a containment isolation signal. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 6.2.
2. UFSAR, Section 15.14.
3. 10 CFR 50.36.
4. UFSAR, Table 6-7.
5. Generic Letter 91-08

BASES

ACTIONS (continued)

B.1 and B.2

If the Required Action and associated Completion Time is not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and to MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.6.4.1

Verifying that containment pressure is within limits ensures that operation remains within the limits assumed in the containment analysis. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapter 15.
2. UFSAR, Section 6.2.
3. 10 CFR 50, Appendix K.
4. 10 CFR 50.36.

BASES

ACTIONS

G.1 (continued)

conditions from full power conditions in an orderly manner and without challenging unit systems.

H.1

With two reactor building spray trains, two reactor building cooling trains or any combination of three or more reactor building spray and reactor building cooling trains inoperable in MODE 1 or 2, the unit is in a condition outside the accident analysis. Therefore, LCO 3.0.3 must be entered immediately.

With any combination of two or more required reactor building spray and reactor building cooling trains inoperable in MODE 3 or 4, the unit is in a condition outside the accident analysis. Therefore, LCO 3.0.3 must be entered immediately.

SURVEILLANCE REQUIREMENTS

SR 3.6.5.1

Verifying the correct alignment for manual and non-automatic power operated valves in the reactor building spray and cooling flow path provides assurance that the proper flow paths will exist for Reactor Building Spray and Cooling System operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since these were verified to be in the correct position prior to locking, sealing, or securing. Similarly, this SR does not apply to automatic valves since automatic valves actuate to their required position upon an accident signal. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This SR does not require any testing or valve manipulation. Rather, it involves verification, through a system walkdown, that those valves outside containment and capable of potentially being mispositioned are in the correct position. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.6.5.1 is modified by a note that states the SR is applicable for Reactor Building Cooling system following completion of the LPSW RB Waterhammer Modification on the respective Unit.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.6.5.2

Operating each required reactor building cooling train fan unit for ≥ 15 minutes ensures that all trains are OPERABLE and that all associated controls are functioning properly. It also ensures that blockage, fan or motor failure, or excessive vibration can be detected for corrective action. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.6.5.3

Verifying that each required Reactor Building Spray pump's developed head at the flow test point is greater than or equal to the required developed head ensures that spray pump performance has not degraded during the cycle. Flow and differential pressure are normal tests of centrifugal pump performance required by Section XI of the ASME Code (Ref. 4). Since the Reactor Building Spray System pumps cannot be tested with flow through the spray headers, they are tested on recirculation flow. This test confirms one point on the pump design curve and is indicative of overall performance. Such inservice tests confirm component OPERABILITY, trend performance, and may detect incipient failures by indicating abnormal performance. The Frequency of this SR is in accordance with the Inservice Testing Program.

SR 3.6.5.4

Verifying the containment heat removal capability provides assurance that the containment heat removal systems are capable of maintaining containment temperature below design limits following an accident. This test verifies the heat removal capability of the Low Pressure Injection (LPI) Coolers and Reactor Building Cooling Units. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.6.5.5 and 3.6.5.6

These SRs require verification that each automatic reactor building spray and cooling valve actuates to its correct position and that each reactor building spray pump starts upon receipt of an actual or simulated actuation signal. The test will be considered satisfactory if visual observation and control board indication verifies that all components have responded to the

BASES

SURVEILLANCE REQUIREMENTS

SR 3.6.5.5 and 3.6.5.6 (continued)

actuation signal properly; the appropriate pump breakers have closed, and all valves have completed their travel. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.6.5.5 is modified by a note that states the SR is applicable for Reactor Building Cooling system following completion of the LPSW RB Waterhammer Modification on the respective Unit.

SR 3.6.5.7

This SR requires verification that each required reactor building cooling train actuates upon receipt of an actual or simulated actuation signal. The test will be considered satisfactory if control board indication verifies that all components have responded to the actuation signal properly, the appropriate valves have completed their travel, and fans are running at half speed. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.6.5.8

With the reactor building spray header isolated and drained of any solution, station compressed air is introduced into the spray headers to verify the availability of the headers and spray nozzles. Performance of this Surveillance demonstrates that each spray nozzle is unobstructed and provides assurance that spray coverage of the containment during an accident is not degraded. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 3.1.
2. UFSAR, Section 6.2.
3. 10 CFR 50.36.
4. ASME, Boiler and Pressure Vessel Code, Section XI.

BASES

ACTIONS

C.1 and C.2 (continued)

Inoperable TSVs that cannot be restored to OPERABLE status within the specified Completion Time, but are closed, must be verified on a periodic basis to be closed. This is necessary to ensure that the assumptions in the safety analysis remain valid. The 7 day Completion Time is reasonable, based on engineering judgment, in view of TSV status indications available in the control room, and other administrative controls, to ensure these valves are in the closed position.

D.1 and D.2

If the TSV cannot be restored to OPERABLE status or closed in the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 4 within 18 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from MODE 2 conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.2.1 and SR 3.7.2.2

These SRs verify that TSV closure time of each TSV is ≤ 1.0 second on an actual or simulated actuation signal from Channel A and Channel B. The 1.0 second TSV closure time is assumed in the accident and containment analyses. This Surveillance is normally performed upon returning the unit to operation following a refueling outage.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This test is conducted in MODE 3, with the unit at operating temperature and pressure, as discussed in the Reference 5 exercising requirements. This SR is modified by a Note that allows entry into and operation in MODE 3 prior to performing the SR. This allows delaying testing until MODE 3 in order to establish conditions consistent with those under which the acceptance criterion was generated.

BASES

ACTIONS

A.1 and A.2

With one or both of the ADV flow path(s) inoperable, the Unit must be placed in a condition in which the LCO does not apply. To achieve this status, the Unit must be placed in at least MODE 3 within 12 hours, and at least MODE 4 without reliance on a steam generator for heat removal within 24 hours. The Completion Times are reasonable, based on operating experience, to reach the required Unit conditions from full power conditions in an orderly manner and without challenging Unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.4.1

To perform a controlled cool down of the RCS, the valves that comprise the ADV flow path for each steam generator must be able to perform the following functions:

a) the atmospheric dump block valve bypass and the atmospheric vent valve must be capable of being opened and closed; and

b) the atmospheric dump control valve and atmospheric vent block valve must be capable of being opened and throttled through their full range.

This SR ensures that the valves that comprise the ADV flow path for each steam generator are cycled through the full control range. Performance of inservice testing or use of an ADV flow path during a unit cool down satisfies this requirement. This surveillance does not require the valves to be tested at pressure. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.36.
2. UFSAR, Section 10.3.
3. UFSAR, Section 15.9.
4. UFSAR, Section 15.12
5. UFSAR, Section 15.14

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.5.1

Verifying the correct alignment for manual, and non-automatic power operated valves in the EFW water and steam supply flow paths provides assurance that the proper flow paths exist for EFW operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since those valves are verified to be in the correct position prior to locking, sealing, or securing.

This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves. This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.5.2

Verifying that each EFW pump's developed head at the flow test point is greater than or equal to the required developed head ensures that EFW pump performance has not degraded below the acceptance criteria during the cycle. Flow and differential head are normal indications of pump performance required by Section XI of the ASME Code (Ref. 3). Because it is undesirable to introduce cold EFW into the steam generators while they are operating, this test may be performed on a test flow path.

This test confirms OPERABILITY, trends performance, and detects incipient failures by indicating abnormal performance. Performance of inservice testing in the ASME Code, Section XI (Ref. 3), at 3 month intervals, satisfies this requirement.

SR 3.7.5.3

This SR verifies that EFW can be delivered to the appropriate steam generator in the event of any accident or transient that generates an Emergency Feedwater System initiation signal by demonstrating that each automatic valve in the flow path actuates to its correct position on an actual or simulated actuation signal. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.5.3 (continued)

controls. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. This SR is modified by a Note which states that the SR is not required in MODES 3 and 4. In MODES 3 and 4, the heat removal requirements would be less, thereby providing more time for operator action to manually start the required EFW pump.

SR 3.7.5.4

This SR verifies that each EFW pump starts in the event of any accident or transient that generates an initiation signal. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. This SR is modified by a Note which states that the SR is not required in MODES 3 and 4. In MODE 3 and 4, the heat removal requirements would be less, thereby providing more time for operator action to manually start the required EFW pump.

SR 3.7.5.5

This SR ensures that the EFW System is properly aligned by verifying the flow paths to each steam generator prior to entering MODE 2 after more than 30 days in MODE 5 or 6. OPERABILITY of EFW flow paths must be demonstrated before sufficient core heat is generated that would require the operation of the EFW System during a subsequent shutdown. The Frequency is reasonable, based on engineering judgment, in view of other administrative controls to ensure that the flow paths are OPERABLE. To further ensure EFW System alignment, flow path OPERABILITY is verified, following extended outages to determine no misalignment of valves has occurred. This SR ensures that the flow path from the UST to the steam generator is properly aligned.

BASES

ACTIONS

A.1 and A.2 (continued)

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.6.1

This SR verifies that the UST and HW contain the required volume of cooling water. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 10.4.
2. UFSAR, Chapter 10.
3. UFSAR, Chapter 15.
4. 10 CFR 50.36.

BASES

ACTIONS

C.1 and C.2 (continued)

must be placed in at least MODE 3 within 12 hours, and in MODE 5 within 60 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems. The extended interval to reach MODE 5 provides additional time to restore the required LPSW pump and is reasonable considering that the potential for an accident or transient is reduced in MODE 3.

SURVEILLANCE REQUIREMENTS

SR 3.7.7.1

For Units with LPSW RB Waterhammer Prevention System installed, verifying the correct level in the leakage accumulator will provide assurance that in the event of boundary valve leakage during a LOOP event, there is sufficient water to keep the LPSW piping filled. The required water level is between half full and full, which corresponds to a level indication of 20.5" to 41". Any level glass reading is bounded by 20.5" to 41" level indication, therefore any level glass reading is considered acceptable. During LPSW testing, accumulator level > 41" is acceptable because the mass of air in the accumulator is unchanged in the short term; therefore the accumulator is still capable of performing its safety function.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.7.2

Verifying the correct alignment for manual, and power operated valves in the LPSW System flow path provides assurance that the proper flow paths exist for LPSW System operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since they are verified to be in the correct position prior to locking, sealing, or securing. This SR does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.7.2 (continued)

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note indicating that the isolation of components or systems supported by the LPSW System does not affect the OPERABILITY of the LPSW System.

SR 3.7.7.3

The SR verifies proper automatic operation of the LPSW System valves. The LPSW System is a normally operating system that cannot be fully actuated as part of the normal testing. This SR is not required for valves that are locked, sealed, or otherwise secured in position under administrative controls. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.7.4

The SR verifies proper automatic operation of the LPSW System pumps on an actual or simulated actuation signal. The LPSW System is a normally operating system that cannot be fully actuated as part of normal testing during normal operation. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.7.5

For Units with LPSW RB Waterhammer Prevention System installed, the SR verifies proper operation of the LPSW RB Waterhammer Prevention System leakage accumulator. Verifying adequate flow from the accumulator will provide assurance that in the event of boundary valve leakage during a LOOP event, there is sufficient water to keep LPSW piping filled.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.7.6

For Units with LPSW RB Waterhammer Prevention System installed, the SR verifies that LPSW WPS boundary valve leakage is ≤ 20 gpm. Verifying boundary valve leakage is within limits will ensure that in the event of a LOOP, a waterhammer will not occur, because the LPSW leakage accumulator will be able to maintain the LPSW piping water solid.

The LPSW Leakage Accumulator is designed to allow up to 25 gpm of aggregate leakage for one minute. The boundary valve leakage is limited to 20 gpm in order to allow five (5) gpm of miscellaneous leakage.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 9.2.2.
2. UFSAR, Section 6.3.
3. 10 CFR 50.36.

BASES

ACTIONS

A.1

If one required ECCW siphon header is inoperable, action must be taken to restore the inoperable ECCW siphon header to OPERABLE status within 72 hours.

In this Condition, the remaining ECCW siphon header is adequate to perform the heat removal function. However, the overall reliability is reduced because a single failure in the OPERABLE ECCW siphon header could result in loss of ECCW system function. The 72 hour Completion Time is based on the redundant capabilities afforded by the OPERABLE ECCW siphon header, and the low probability of a accident occurring during this period.

B.1 and B.2

If the Required Action and associated Completion Time are not met, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours and in MODE 5 within 60 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.8.1

This SR requires verification that the required ESV pumps are in operation. Verification includes confirming appropriate vacuum tank pressure or pump status monitoring, which help ensure that ECCW siphon headers are maintained sufficiently primed. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. In addition, control room indication normally indicate pump status and an alarm is provided for low vacuum tank vacuum.

SR 3.7.8.2

Verifying Keowee Lake level is within limit ensures ECCW siphons can provide sufficient flow to ensure adequate NPSH is available for operating the LPSW pumps. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. This SR verifies that the Keowee water level is ≥ limit specified in UFSAR Chapter 16. Lake level requirements are maintained in UFSAR Chapter 16 (Ref. 3) since the values are subject to change resulting from modifications

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.8.2 (continued)

and changes in operating practices, which may impact LPSW System flow requirements.

SR 3.7.8.3

This SR verifies that the average water temperature at the CCW inlet is ≤ 90°F. This SR verifies that CCW inlet temperature is consistent with assumptions in the safety analysis regarding inlet temperature for the LPSW system. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.8.4

Verifying the correct alignment for manual, and non-automatic power operated valves in the ECCW siphon header flow paths, required ESV flow paths and required SSW flow paths provides assurance that the proper flow paths exist for ECCW siphon header operation. This SR does not apply to valves that are locked, sealed, or otherwise secured in position, since those valves are verified to be in the correct position prior to locking, sealing, or securing. Additionally, this SR does not apply to automatic valves since these valves actuate to the correct position upon initiation. This SR also does not apply to valves that cannot be inadvertently misaligned, such as check valves.

This Surveillance does not require any testing or valve manipulation; rather, it involves verification that those valves capable of potentially being mispositioned are in the correct position.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.8.5

Verification that ESV float valves open upon an actual or simulated actuation ensures a flow path is provided to the ESV pumps to assure the ECCW siphon headers are maintained sufficiently primed. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.8.6

Verification that required ESV valves actuate to the correct position ensures the ESV tank minimum flow valves will automatically close during a loss of offsite power event so that the full capacity of the ESV pumps will be aligned to the ECCW siphon headers. Verification that required SSW valves actuate to the correct position ensures sufficient seal water is provided to ESV pumps. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.8.7

Verifying that each ESV pump's capacity at the test point is greater than or equal to the required capacity ensures that pump performance has not degraded below the acceptance criteria during the cycle. ESV pump capacity is determined by measuring the "apparent" flow rate and calculating the "corrected" flow rate by adjusting for air density changes between the measurement point and the pump inlet. The vacuum level must be within a prescribed range during this measurement to ensure that the flowmeter is on-scale and the pump operating liquid is not cavitating. Note that the pump is a constant volume machine. Thus, there is not a single test point but a range of acceptable vacuum levels. Although ASME code for inservice testing does not specifically address vacuum pumps, manufacturers test methods coupled with the ASME standard (OM-6) (Ref. 4) requirements for testing methodology are used as a guide for testing. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.8.8

Verification that each required ESV pump automatically starts within 1200 seconds after an actual or simulated restoration of emergency power assures required ESV pumps will function after a loss of offsite power to maintain ECCW siphon headers sufficiently primed to maintain necessary flow to the suction of LPSW pumps. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.7.8.9

This SR verifies the ECCW system functions to supply siphon header flow to the suction of the LPSW pumps during design basis conditions by ensuring air accumulation in the ECCW siphon headers is within the removal capabilities of the ESV System. This SR establishes siphon flow with the ESV pumps off. Air accumulation in the pipe results in a corresponding reduction in water level in the CCW piping over a time period. The rate of water level reduction is recorded and compared to limits established in design basis documents. The limits on the rate of water level reduction over a time period are established to ensure ECCW siphon header air accumulation rate is within the removal capabilities of the ESV System under design basis conditions. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. This SR is not required to be performed with the Unit 3 LPSW System taking suction from the siphon. This is acceptable since aligning the LPSW pumps to the Unit 3 ECCW siphon headers is not necessary to demonstrate that the ECCW air accumulation is within the ESV capacity which is the basic purpose of the test. The flow path from the Unit 3 CCW piping to the suction of the Unit 3 LPSW pumps is demonstrated by normal operation of the LPSW pumps.

A Note states that for Units 1 and 2, the SR is not required to be performed with the shared LPSW System for Units 1 and 2 taking suction from the siphon. This is necessary to avoid potential effects on an operating unit and is acceptable since the capability of the LPSW pumps to take suction from the CCW crossover header is demonstrated by normal, day-to-day operation of the LPSW pumps. Although a loss of suction to the LPSW pumps is unlikely during this SR, it is prudent to minimize the potential for jeopardizing the LPSW suction supply to the LPSW pumps when they are supporting an operating Unit.

REFERENCES

1. UFSAR, Chapter 9.
2. 10 CFR 50.36.
3. UFSAR, Chapter 16.
4. ASME Standard OM-6.

BASES

ACTIONS (continued)

E.1

During movement of recently irradiated fuel assemblies, when one or more CRVS trains are inoperable, action must be taken immediately to suspend activities that could release radioactivity that might require isolation of the control room. This places the unit in a condition that minimizes the accident risk. This does not preclude the movement of fuel to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.7.9.1

Standby systems should be checked periodically to ensure that they function properly. As the environment and normal operating conditions on this system are not severe, testing each train adequately checks this system. The trains need only be operated for ≥ one hour and all dampers verified to be OPERABLE to demonstrate the function of the system. This test includes an external visual inspection of the CRVS Booster Fan trains. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.7.9.2

This SR verifies that the required CRVS Booster Fan train testing is performed in accordance with the Ventilation Filter Testing Program (VFTP). The CRVS Booster Fan train filter test frequencies are in accordance with Regulatory Guide 1.52 (Ref. 4). The VFTP includes testing HEPA filter performance and carbon adsorber efficiency. Specific test frequencies and additional information are discussed in detail in the VFTP.

SR 3.7.9.3

This SR verifies the integrity of the Control Room enclosure. The Control Room positive pressure, with respect to potentially contaminated adjacent areas, is periodically tested to verify that the CRVS Booster Fan trains are functioning properly. During the emergency mode of operation, the CRVS Booster Fan trains are designed to pressurize the Control Room to minimize unfiltered inleakage. The CRVS Booster Fan trains are designed to maintain this positive pressure with both trains in operation.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.9.3 (continued)

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 9.4.
2. UFSAR, Chapter 15.
3. 10 CFR 50.36.
4. Regulatory Guide 1.52, Rev. 2, March 1978.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.7.11.1

This SR verifies that sufficient Spent Fuel Pool water is available in the event of a fuel handling or cask drop accident. The water level in the Spent Fuel Pool must be checked periodically. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

During refueling operations, the level in the Spent Fuel Pool is at equilibrium with that in the fuel transfer canal, and the level in the fuel transfer canal is checked in accordance with SR 3.9.6.1.

REFERENCES

1. UFSAR, Section 9.1.2.
2. UFSAR, Section 9.1.3.
3. UFSAR, Section 15.11.2.
4. Regulatory Guide 1.183, July 2000.
5. WCAP-7828, December 1971.
6. 10 CFR 50.36

BASES

ACTIONS

A.1 and A.2 (continued)

If moving irradiated fuel assemblies while in MODE 5 or 6, LCO 3.0.3 would not specify any action. If moving irradiated fuel assemblies while in MODE 1, 2, 3, or 4, the fuel movement is independent of reactor operation. Therefore, inability to suspend movement of fuel assemblies is not a sufficient reason to require a reactor shutdown.

When the concentration of boron in the SFP is less than required, immediate action must be taken to preclude the occurrence of an accident or to mitigate the consequences of an accident in progress. This is achieved by immediately suspending the movement of the fuel assemblies. This does not preclude movement of a fuel assembly to a safe position. Immediate action is also required to initiate action to restore the SFP boron concentration to within limits.

SURVEILLANCE REQUIREMENTS

SR 3.7.12.1

This SR verifies that the concentration of boron in the SFP is within the required limit. As long as this SR is met, the analyzed incidents are fully addressed. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The COLR revision process assures that the minimum boron concentration specified in the COLR bounds the limit specified by this SR.

REFERENCES

1. 10 CFR 50.68(b).

2. American Nuclear Society, "American National Standard Design Requirements for Light Water Reactor Fuel Storage Facilities at Nuclear Power Plants," ANSI/ANS-57.2-1983, October 7, 1983.

3. Nuclear Regulatory Commission, Memorandum to Timothy Collins from Laurence Kopp, "Guidance on the Regulatory Requirements for Criticality Analysis of Fuel Storage at Light Water Reactor Power Plants," August 19, 1998.

4. Double contingency principle of ANSI N16.1-1975, as specified in the April 14, 1978 NRC letter (Section 1.2) and implied in the proposed revision to Regulatory Guide 1.13 (Section 1.4, Appendix A).

BASES (continued)

LCO

As indicated in the Applicable Safety Analyses, the specific activity limit in the secondary coolant system of ≤ 0.10 μCi/gm DOSE EQUIVALENT I-131 maintains the radiological consequences of an accident to within Reference 1 limits.

Monitoring the specific activity of the secondary coolant ensures that, when secondary specific activity limits are exceeded, appropriate actions are taken, in a timely manner, to place the unit in an operational MODE that would minimize the radiological consequences of an accident.

APPLICABILITY

In MODES 1, 2, 3, and 4, the limits on secondary specific activity apply due to the potential for secondary steam releases to the atmosphere.

In MODES 5 and 6, the steam generators are not being used for heat removal. Both the RCS and steam generators are at low pressure and primary to secondary LEAKAGE is minimal. Therefore, secondary specific activity is not a concern.

ACTIONS

A.1 and A.2

DOSE EQUIVALENT I-131 exceeding the allowable value in the secondary coolant contributes to increased post accident doses. If secondary specific activity cannot be restored to within limits within the associated Completion Time, the unit must be placed in a MODE in which the LCO does not apply. To achieve this status, the unit must be placed in at least MODE 3 within 12 hours, and in MODE 5 within 36 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.7.14.1

This SR verifies that the secondary specific activity is within the limits of the accident analysis assumptions. A gamma isotopic analysis of the secondary coolant, which determines DOSE EQUIVALENT I-131, confirms the assumptions of Reference 1 are met. It also serves to identify and trend any unusual isotopic concentrations that might indicate changes in reactor coolant activity or LEAKAGE. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.7.16.1

This SR verifies that the heat removal capability of the system is sufficient to maintain the temperature in the control room and cable room at or below 80°F and maintain the temperature in the electrical equipment room at or below 85°F. The temperature is determined by reading gauges in each area or computer points which are considered representative of the average area temperature. These temperature limits are based on operating history and are intended to provide an indication of degradation of the cooling systems. The limits are conservative with respect to equipment operability temperature limits. The values for the SR are values at which the system is removing sufficient heat to meet design requirements (i.e., OPERABLE) and sufficiently above the values associated with normal operation during hot weather. The temperature in the equipment room is typically slightly higher than the temperature in the control room or cable room. Because of that, a higher value is specified for this area. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 3.11.5.
2. UFSAR, Section 9.4.1.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.1 (continued)

connected to their power source, and that appropriate separation of offsite sources is maintained. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.2

This SR verifies adequate battery voltage when the KHU batteries are on float charge. This SR is performed to verify KHU battery OPERABILITY. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.3

This SR verifies the availability of the KHU associated with the underground emergency power path to start automatically and energize the underground power path. Utilization of either the auto-start or emergency start sequence assures the control function OPERABILITY by verifying proper speed control and voltage. Power path verification is included to demonstrate breaker OPERABILITY from the KHU onto the standby buses. This is accomplished by closing the Keowee Feeder Breakers (SK) to energize each deenergized standby bus. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.4

This surveillance verifies the availability of the KHU associated with the overhead emergency power path. Utilization of either the auto-start or emergency start sequence assures the control function OPERABILITY by verifying proper speed control and voltage. The ability to supply the overhead emergency power path is satisfied by demonstrating the ability to synchronize (automatically or manually) the KHU with the grid system. If an automatic start of the KHU is performed and a manual synchronization is desired, the KHU will need to be shutdown and re-started in manual to allow a manual synchronization of the KHU. The SR also requires that the underground power path be energized after removing the KHU from the overhead emergency power path. This surveillance can be satisfied by first demonstrating the ability of the KHU

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.4 (continued)

associated with the underground emergency path to energize the underground path then synchronizing the KHU to the overhead emergency power path. The SR is modified by a Note indicating that the requirement to energize the underground emergency power path is not applicable when the overhead disconnects are open for the KHU associated with the underground emergency power path or 2) when complying with Required Action D.1. The latter exception is necessary since Required Action D.1 continues to be applicable when both KHUs are inoperable.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.5

This surveillance verifies OPERABILITY of the trip functions of each closed SL and each closed N breaker. Neither of these breakers have any automatic close functions; therefore, only the trip coils require verification. Cycling of each breaker demonstrates functional OPERABILITY and the coil monitor circuits verify the integrity of each trip coil. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR modified by a Note that states it is not required to be performed for an SL breaker when its standby bus is energized from a LCT via an isolated power path. This is necessary since the standby buses are required to be energized from a LCT by several Required Actions of Specification 3.8.1 and the breakers must remain closed to energize the standby buses from a LCT.

SR 3.8.1.6

Infrequently used source breakers are cycled to ensure OPERABILITY. The Standby breakers are to be cycled one breaker at a time to prevent inadvertent interconnection of two units through the standby bus breakers. Cycling the startup breakers verifies OPERABILITY of the breakers and associated interlock circuitry between the normal and startup breakers. This circuitry provides an automatic, smooth, and safe transfer of auxiliaries in both directions between sources. The Surveillance Frequency is based on operating experience, equipment

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.6 (continued)

reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note which states the SR is not required to be performed for an S breaker when its standby bus is energized from a LCT via an isolated power path. This is necessary since the standby buses are required to be energized from a LCT by several Required Actions of Specification 3.8.1 and cycling the S breakers connects the standby buses with the main feeder buses which are energized from another source.

SR 3.8.1.7

The KHU tie breakers to the underground path, ACB3 and ACB4, are interlocked to prevent cross-connection of the KHU generators. The safety analysis utilizes two independent power paths for accommodating single failures in applicable accidents. Connection of both generators to the underground path compromises the redundancy of the emergency power paths. Installed test logic is used to verify a circuit to the close coil on one underground ACB does not exist with the other underground ACB closed. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.8

Each KHU tie breaker to the underground emergency power path and tie breaker to the overhead emergency path, are interlocked to prevent the unit associated with the underground circuit from automatically connecting to the overhead emergency power path. The safety analysis utilizes two independent power paths for accommodating single failures in applicable accidents. Connection of both generators to the overhead emergency power path compromises the redundancy of the emergency power paths. Temporary test instrumentation is used to verify a circuit to the close coil on the overhead ACB does not exist with the Underground ACB closed. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.9

This surveillance verifies the KHUs' response time to an Emergency Start signal (normally performed using a pushbutton in the control room) to ensure ES equipment will have adequate power for accident mitigation. UFSAR Section 6.3.3.3 (Ref. 9) establishes the 23 second time requirement for each KHU to achieve rated frequency and voltage. Since the only available loads of adequate magnitude for simulating a accident is the grid, subsequent loading on the grid is required to verify the KHU's ability to assume rapid loading under accident conditions. Sequential block loads are not available to fully test this feature. This is the reason for the requirement to load the KHUs at the maximum practical rate. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.10

A battery service test is a special test of the battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.11

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.1.12

Verification of cell to cell connection cleanliness, tightness, and proper coating with anti-corrosion grease provides an indication of any abnormal condition, and assures continued OPERABILITY of the battery. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.8.1.13

The KHU underground ACBs have a control feature which will automatically close the KHU, that is pre-selected to the overhead path, into the underground path upon an electrical fault in the zone overlap region of the protective relaying. This circuitry prevents an electrical fault in the zone overlap region of the protective relaying from locking out both emergency power paths during dual KHU grid generation. In order to ensure this circuitry is OPERABLE, an electrical fault is simulated in the zone overlap region and the associated underground ACBs are verified to operate correctly. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by a Note indicating the SR is only applicable when the overhead disconnects to the underground KHU are closed. When the overhead disconnects to the underground KHU are open, the circuitry preventing the zone overlap protective lockout of both KHUs is not needed.

SR 3.8.1.14

This surveillance verifies OPERABILITY of the trip functions of the SL and N breakers. This SR verifies each trip circuit of each breaker independently opens each breaker. Neither of these breakers have any automatic close functions; therefore, only the trip circuits require verification. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

The SR is modified by a Note indicating that the SR is not required for an SL breaker when its standby bus is energized by a LCT via an isolated power path. This is necessary since the standby buses are required to be energized from a LCT by several Required Actions of Specification 3.8.1 and the breakers must remain closed to energize the standby buses from a LCT.

SR 3.8.1.15

This surveillance verifies proper operation of the 230 kV switchyard circuit breakers upon an actual or simulated actuation of the Switchyard Isolation circuitry. This test causes an actual switchyard isolation (by

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.1.15 (continued)

actuation of degraded grid voltage protection) and alignment of KHUs to the overhead and underground emergency power paths. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program. The effect of this SR is not significant because the generator red bus tie breakers and feeders from the Oconee 230 kV switchyard red bus to the system grid remain closed. Either Switchyard Isolation Channel causes full system realignment, which involves a complete switchyard realignment. To avoid excessive switchyard circuit breaker cycling, realignment and KHU emergency start functions, this SR need be performed only once each SR interval.

SR 3.8.1.16

This SR verifies by administrative means that one KHU provides an alternate manual AC power source capability by manual or automatic KHU start with manual synchronize, or breaker closure, to energize its non-required emergency power path. That is, when the KHU to the overhead emergency power path is inoperable, the SR verifies by administrative means that the overhead emergency power path is OPERABLE. When the overhead emergency power path is inoperable, the SR verifies by administrative means that the KHU associated with the overhead emergency power path is OPERABLE.

This SR is modified by a Note indicating that the SR is only applicable when complying with Required Action C.2.2.4.

SR 3.8.1.17

This SR verifies the Keowee Voltage and Frequency out of tolerance logic trips and blocks closure of the appropriate overhead or underground power path breakers on an out of tolerance trip signal. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.1 (continued)

proper voltage availability on the distribution centers ensures that the required voltage is readily available for isolating transfer diodes connected to these distribution centers. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.3.2

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the charging system and the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery (or battery cell) and maintain the battery (or a battery cell) in a fully charged state. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the initial voltages assumed in the battery sizing calculations. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.3.3

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance. The presence of physical damage or deterioration does not necessarily represent a failure of this SR, provided an evaluation determines that the physical damage or deterioration does not affect the OPERABILITY of the battery (its ability to perform its design function).

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.3.4

Visual inspection of inter-cell, inter-rack, inter-tier, and terminal connections provide an indication of physical damage or abnormal deterioration that could indicate degraded battery condition. The

BASES

SURVEILLANCE REQUIREMENTS

SR 3.8.3.4 (continued)

anticorrosion material is used to help ensure good electrical connections and to reduce terminal deterioration. The visual inspection for corrosion is not intended to require removal of and inspection under each terminal connection.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.3.5

A battery service test is a special test of the battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length should correspond to the design duty cycle requirements as specified in Reference 4.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.3.6

This SR requires battery capacity be verified in accordance with the Battery Discharge Testing Program. A battery performance discharge test is a test of constant current capacity of a battery, normally done in the as found condition, after having been in service, to detect any change in the capacity determined by the acceptance test.

The test is intended to determine overall battery degradation due to age and usage.

The Surveillance Frequencies for this test are in accordance with the Battery Discharge Testing Program and are consistent with the recommendations in IEEE-450 (Ref. 5). These periodic frequencies are based on the outcome of the previous battery capacity test.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.5.1

This SR verifies that Category A battery cell parameters are consistent with IEEE-450 (Ref. 4), which recommends regular battery inspections including voltage, specific gravity, and electrolyte temperature of pilot cells.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.5.2

The periodic inspection of specific gravity and voltage is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.5.3

This Surveillance verification that the average temperature of representative cells is ≥ 60°F is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

Lower than normal temperatures act to inhibit or reduce battery capacity. This SR ensures that the operating temperatures remain within an acceptable operating range. This limit is based on plant specific calculations.

Table 3.8.5-1

This table delineates the limits on electrolyte level, float voltage, and specific gravity for three different categories. The meaning of each category is discussed below.

Category A defines the normal parameter limit for each designated pilot cell in each battery. The cells selected as pilot cells are those whose temperature, voltage and electrolyte specific gravity are considered to approximate the state of charge of the entire battery.

The Category A limits specified for electrolyte level are based on manufacturer recommendations and are consistent with the guidance in IEEE-450 (Ref. 4), with the extra ¼ inch allowance above the high water level indication for operating margin to account for temperatures and charge effects. In addition to this allowance, footnote a to Table 3.8.5-1 permits the electrolyte level to be above the specified maximum level during equalizing charge, provided it is not overflowing. These limits

BASES

ACTIONS

A.1 (continued)

based upon engineering judgment, taking into consideration the time required to repair an inverter and the additional risk to which the unit is exposed because of the inverter inoperability. This has to be balanced against the risk of an immediate shutdown, along with the potential challenges to safety systems such a shutdown might entail. When the 120 VAC Vital Instrumentation panelboard is powered from its regulated voltage source, it is relying upon interruptible AC electrical power sources (offsite and onsite). The uninterruptible inverter source to the 120 VAC Vital Instrumentation panelboards is the preferred source for powering instrumentation trip setpoint devices.

Required Action A.1 is also modified by Note 2 which indicates that the Completion Time is reduced when in Condition L of LCO 3.8.1. Condition L limits the Completion Time for restoring an inoperable vital inverter to 4 hours when emergency power source(s) or offsite power source(s) are inoperable for extended time periods or for specific reasons.

B.1 and B.2

If the Required Action and associated Completion Time are not met, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the unit must be brought to at least MODE 3 within 12 hours and to MODE 5 within 84 hours. The allowed Completion Times are reasonable, based on operating experience, to reach the required unit conditions from full power conditions in an orderly manner and without challenging unit systems.

SURVEILLANCE REQUIREMENTS

SR 3.8.6.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and 120 VAC Vital Instrumentation panelboards energized from the inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation of the RPS and ES connected to the 120 VAC Vital Instrumentation panelboards. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

ACTIONS

A.1, A.2.1, A.2.2, A.2.3, and A.2.4 (continued)

the associated inverter(s) inoperable, appropriate restrictions will be implemented in accordance with the affected required features LCOs' Required Actions. In many instances, this option may involve undesired administrative efforts. Therefore, the allowance for sufficiently conservative actions is made (i.e., to suspend CORE ALTERATIONS, movement of recently irradiated fuel assemblies, and operations involving positive reactivity additions).

Suspension of these activities shall not preclude completion of actions to establish a safe conservative condition. These actions minimize the probability of the occurrence of postulated events. It is further required to immediately initiate action to restore the required inverters and to continue this action until restoration is accomplished in order to provide the necessary inverter power to the unit safety systems.

The Completion Time of immediately is consistent with the required times for actions requiring prompt attention. The restoration of the required inverters should be completed as quickly as possible in order to minimize the time the unit safety systems may be without power or powered from an alternate regulated voltage source.

SURVEILLANCE REQUIREMENTS

SR 3.8.7.1

This Surveillance verifies that the inverters are functioning properly with all required circuit breakers closed and 120 VAC Vital Instrumentation panelboards energized from the inverter. The verification of proper voltage and frequency output ensures that the required power is readily available for the instrumentation connected to the 120 VAC Vital Instrumentation panelboards. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. 10 CFR 50.36.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.8.1

This Surveillance verifies that the main feeder buses are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence is maintained, and the appropriate voltage is available to each required bus. The verification of proper voltage availability on the buses ensures that the required voltage is readily available for motive as well as control functions for critical system loads connected to these buses. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.8.2

This Surveillance verifies that the required AC, DC, and AC vital electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence is maintained, and the appropriate voltage is available to each ES power string and panelboard. The verification of voltage availability on the ES power strings, and panelboards ensures that voltage is readily available for motive as well as control functions for critical system loads connected to the ES power strings, and panelboards. Verification of voltage availability may be accomplished by observing alarm conditions, status lights or by confirming proper operation of a component supplied from each ES power string or panelboard. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 15.
3. Regulatory Guide 1.93, December 1974.
4. 10 CFR 50.36.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.8.9.1

This Surveillance verifies that the required main feeder buses are functioning properly, with all the required main feeder buses energized. The verification of proper voltage availability on the buses, ES power strings and panelboards ensures that the required power is readily available for motive as well as control functions for critical system loads connected to these buses. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.8.9.2

This Surveillance verifies that the required AC, DC, and AC vital electrical power distribution systems are functioning properly, with the correct circuit breaker alignment. The correct breaker alignment ensures the appropriate separation and independence is maintained, and the appropriate voltage is available to each ES power strings and panelboards. The verification of voltage availability on the ES power strings, and panelboards ensures that voltage is readily available for motive as well as control functions for critical system loads connected to the ES power strings, and panelboards. Verification of voltage availability may be accomplished by observing alarm conditions, status lights or by confirming proper operation of a component supplied from each ES power string or panelboard. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Chapter 6.
2. UFSAR, Chapter 14.
3. 10 CFR 50.36.

BASES

ACTIONS

A.1 and A.2 (continued)

Suspension of CORE ALTERATIONS and positive reactivity additions shall not preclude moving a component to a safe position.

A.3

In addition to immediately suspending CORE ALTERATIONS and positive reactivity additions, action to restore the concentration must be initiated immediately.

One means of complying with the action is to initiate boration of the affected volume. In determining the required combination of boration flow rate and concentration, there is no unique Design Basis Event that must be satisfied. The only requirement is to restore the boron concentration to its required value as soon as possible. In order to raise the boron concentration as soon as possible, the operator should begin boration with the best source available for unit conditions.

Once actions have been initiated, they must be continued until the boron concentration is restored. The restoration time depends on the amount of boron that must be injected to reach the required concentration.

SURVEILLANCE REQUIREMENTS

SR 3.9.1.1

This SR ensures the coolant boron concentration in the RCS and the refueling canal is within the COLR limits. The boron concentration of the coolant in each volume is determined by chemical analysis.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 3.1

2. 10 CFR 50.36.

BASES

ACTIONS

B.2 (continued)

made in accordance with Required Actions A.1 and A.2, the core reactivity condition is stabilized until the source range neutron flux monitors are restored to OPERABLE status. This stabilized condition is verified by performing SR 3.9.1.1 to ensure that the required boron concentration exists.

The Completion Time of 4 hours is sufficient to obtain and analyze a reactor coolant sample for boron concentration. The Frequency of once per 12 hours ensures that unplanned changes in boron concentration would be identified. The 12 hour Frequency is reasonable, considering the low probability of a change in core reactivity during this time period.

SURVEILLANCE REQUIREMENTS

SR 3.9.2.1

SR 3.9.2.1 is the performance of a CHANNEL CHECK, which is a comparison of the parameter indicated on one channel to a similar parameter on other channels. It is based on the assumption that the indication channel(s) should be consistent with core conditions. Changes in fuel loading and core geometry can result in significant differences between source range channels, but each channel should be consistent with its local conditions. When in MODE 6 with one channel OPERABLE, a CHANNEL CHECK is still required. However, in this condition, a redundant source range instrument may not be available for comparison. The CHANNEL CHECK provides verification that the OPERABLE source range channel is energized and indicates a value consistent with current unit status.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.9.2.2

SR 3.9.2.2 is the performance of a CHANNEL CALIBRATION. This SR is modified by a Note stating that neutron detectors are excluded from the CHANNEL CALIBRATION. The CHANNEL CALIBRATION for the source range nuclear instrument is a complete check and re-adjustment of the channel, from the pre-amplifier input to the indicator. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES (continued)

APPLICABILITY (continued)	without containment closure capability. Therefore, under these conditions no requirements are placed on containment penetration status.

ACTIONS

A.1

With the containment equipment hatch, air locks, or any containment penetration that provides direct access from the containment atmosphere to the outside atmosphere not in the required status, including the Containment Purge and Exhaust Isolation System not capable of automatic actuation when the purge and exhaust valves are open, the unit must be placed in a condition in which the isolation function is not needed. This is accomplished by immediately suspending movement of recently irradiated fuel assemblies within containment. Performance of these actions shall not preclude moving a component to a safe position.

SURVEILLANCE REQUIREMENTS

SR 3.9.3.1

This Surveillance demonstrates that each of the containment penetrations required to be in its closed position is in that position. Also the Surveillance will demonstrate that each open penetration's valve operator has motive power, which will ensure each valve is capable of being closed.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

As such, this Surveillance ensures that a postulated fuel handling accident involving handling recently irradiated fuel that releases fission product radioactivity within the containment will not result in a release of significant fission product radioactivity to the environment.

SR 3.9.3.2

This Surveillance demonstrates that each containment purge supply and exhaust isolation valve that is not locked, sealed or otherwise secured in the isolation position actuates to its isolation position on an actual or simulated high radiation signal. The frequency requires the isolation capability of the reactor building purge valves to be verified functional once each refueling outage prior to movement of recently irradiated fuel assemblies within containment. This ensures that this function is verified prior to movement of recently irradiated fuel assemblies within

BASES

SURVEILLANCE REQUIREMENTS

SR 3.9.3.2 (continued)

containment. This Surveillance will ensure that the valves are capable of closing after a postulated fuel handling accident involving handling recently irradiated fuel to limit a release of fission product radioactivity from the containment.

REFERENCES

1. UFSAR, Section 15.11.

2. NRC letter to RG & E dated December 7, 1995, R.E. Ginna Nuclear Power Plant Conversion to Improved Standard Technical Specifications - Resolutions of Ginna Design Basis for Refueling Accidents.

3. Regulatory Guide 1.183, July 2000

BASES

ACTIONS (continued)

A.3

If DHR loop requirements are not met, actions shall be initiated immediately in order to satisfy DHR loop requirements.

Restoration of one decay heat removal loop is required because this is the only active method of removing decay heat. Dissipation of decay heat through natural convection should not be relied upon for an extended period of time. Reliance on natural convection can lead to boiling which results in inventory loss. Sustained inventory loss can eventually result in inadequate decay heat removal from the core with subsequent release of fission products from the core to the reactor building atmosphere. The immediate Completion Time reflects the importance of restoring an adequate heat cooling loop.

A.4

If DHR loop requirements are not met, all containment penetrations providing direct access from the containment atmosphere to outside atmosphere shall be closed within 4 hours.

If no means of decay heat removal can be restored, the core decay heat could raise temperatures and cause boiling in the core which could result in uncovering the core and the release of radioactivity to the reactor building atmosphere. Closure of penetrations providing access to the outside atmosphere will prevent uncontrolled release of radioactivity to the environment.

SURVEILLANCE REQUIREMENTS

SR 3.9.4.1

This Surveillance demonstrates that the DHR loop is in operation and circulating reactor coolant. Verification includes flow rate, temperature, or pump status monitoring, which help assure that forced flow is providing heat removal. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.36.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.5.1

This Surveillance demonstrates that one DHR loop is in operation. The flow rate is determined by the operator as that necessary to provide adequate decay heat removal capability.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.9.5.2

Verification that each required pump is OPERABLE ensures that an additional DHR pump can be placed in operation, if needed, to maintain decay heat removal and reactor coolant circulation. Verification is performed by verifying proper breaker alignment and power available to the required pump. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. 10 CFR 50.36.

BASES (continued)

APPLICABLE SAFETY ANALYSES (continued)	accident is adequately captured by the water, and offsite doses are maintained within allowable limits (Ref. 3). Fuel Transfer Canal water level satisfies Criterion 2 of 10 CFR 50.36
LCO	A minimum fuel transfer canal water level of 21.34 ft above the reactor vessel flange is required to ensure that the radiological consequences of a postulated fuel handling accident inside containment are within acceptable limits as provided by 10 CFR 50.67.
APPLICABILITY	LCO 3.9.6 is applicable when moving irradiated fuel assemblies within the containment. The LCO minimizes the possibility of a fuel handling accident in containment that is beyond the assumptions of the safety analysis. If irradiated fuel is not present in containment, there can be no significant radioactivity release as a result of a postulated fuel handling accident. Requirements for fuel handling accidents in the spent fuel pool are covered by LCO 3.7.11, "Fuel Storage Pool Water Level."
ACTIONS	<u>A.1</u> With a water level of < 21.34 ft above the top of the reactor vessel flange, all operations involving movement of irradiated fuel assemblies shall be suspended immediately to ensure that a fuel handling accident cannot occur. The suspension of fuel movement shall not preclude completion of movement of a component to a safe position.
SURVEILLANCE REQUIREMENTS	<u>SR 3.9.6.1</u> Verification of a minimum water level of 21.34 ft above the top of the reactor vessel flange ensures that the design basis for the postulated fuel handling accident analysis during refueling operations is met. Water at the required level above the top of the reactor vessel flange limits the consequences of damaged fuel rods that are postulated to result from a postulated fuel handling accident inside containment (Ref. 2). The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES (continued)

SURVEILLANCE REQUIREMENTS

SR 3.9.7.1

These valves are to be secured closed to isolate possible dilution paths. The likelihood of a significant reduction in the boron concentration during MODE 6 operations is remote due to the large mass of borated water in the fuel transfer canal and the fact that all unborated water sources are isolated, precluding a dilution. The boron concentration is checked during MODE 6 under SR 3.9.1.1. This Surveillance demonstrates that the valves are closed through a system walkdown. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 15.4.1.

2. 10 CFR 50.36.

BASES

ACTIONS

F.1 (continued)

year. This includes the 7 day Completion Time that leads to entry into Condition F. For example, if the SSF ASW System is inoperable for 10 days, the 45 day special inoperability period is reduced to 35 days. If the SSF ASW System is inoperable for 6 days, Condition A applies and there is no reduction in the 45 day allowance. The limit of 45 days per calendar year minimizes the number and duration of extended outages associated with exceeding the 7 day Completion Time of a Condition.

G.1 and G.2

If the Required Action and associated Completion Time of Condition F are not met or if the Required Action and associated Completion Time of Condition A, B, C, D, or E are not met for reasons other than Condition F, the unit must be brought to a MODE in which the LCO does not apply. To achieve this status, the plant must be brought to MODE 3 within 12 hours and MODE 4 within 84 hours. The allowed Completion Times are appropriate, to reach the required unit conditions from full power conditions in an orderly manner and without challenging plant systems, considering a three unit shutdown may be required.

SURVEILLANCE REQUIREMENTS

SR 3.10.1.1

Performance of the CHANNEL CHECK for each required instrumentation channel ensures that a gross failure of instrumentation has not occurred. A CHANNEL CHECK is normally a comparison of the parameter indicated on one channel with a similar parameter on other channels. It is based on the assumption that instrument channels monitoring the same parameter should read approximately the same value. Significant deviations between the two instrument channels could be an indication of excessive instrument drift in one of the channels or of something even more serious. A CHANNEL CHECK will detect gross channel failure; therefore, it is key in verifying that the instrumentation continues to operate properly between each CHANNEL CALIBRATION. This SR is modified by a Note to indicate that it is not applicable to the SSF RCS temperature instrument channels, which are common to the RPS RCS temperature instrument channels and are normally aligned through a transfer isolation device to each Unit control room. The instrument string to the SSF control room is checked and calibrated periodically per the Surveillance Frequency Control Program.

Agreement criteria are determined based on a combination of the channel instrument uncertainties, including indication and readability. If a

BASES

SURVEILLANCE REQUIREMENTS

SR 3.10.1.1 (continued)

channel is outside the criteria, it may be an indication that the sensor or the signal processing equipment has drifted outside its limit. If the channels are within the criteria, it is an indication that the channels are OPERABLE. If the channels are normally off scale during times when surveillance is required, the CHANNEL CHECK will only verify that they are off scale in the same direction. Off scale low current loop channels are verified to be reading at the bottom of the range and not failed downscale.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.10.1.2

Verifying battery terminal voltage while on float charge for the batteries helps to ensure the effectiveness of the charging system and the ability of the batteries to perform their intended function. Float charge is the condition in which the charger is supplying the continuous charge required to overcome the internal losses of a battery (or battery cell) and maintain the battery (or a battery cell) in a fully charged state. The voltage requirements are based on the nominal design voltage of the battery and are consistent with the initial voltages assumed in the battery sizing calculations. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.10.1.3 and 3.10.1.4

SR 3.10.1.3 provides verification that the level of fuel oil in the day tank is at or above the level at which fuel oil is automatically added. The level is expressed as an equivalent volume in gallons. The day tank is sized based on the amount of fuel oil required to successfully start the DG and to allow for orderly shutdown of the DG upon loss of fuel oil from the main storage tank.

SR 3.10.1.4 provides verification that there is an adequate inventory of fuel oil in the storage tanks to support SSF DG operation for 72 hours at full load. The 72 hour period is sufficient time to place the unit in a safe shutdown condition

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.5

The SR requires the DG to start (normal or emergency) from standby conditions and achieve required voltage and frequency. Standby conditions for a DG means that the diesel engine coolant and oil are being continuously circulated and temperature is being maintained consistent with manufacturer recommendations. This SR is modified by a Note to indicate that all DG starts for this Surveillance may be preceded by an engine prelube period and followed by a warmup period prior to loading. This minimizes wear on moving parts that do not get lubricated when the engine is running.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.10.1.6

This Surveillance ensures that sufficient air start capacity for the SSF DG is available, without the aid of the refill compressor. The SSF DG air start system is equipped with four air storage tanks. Each set of two tanks will provide sufficient air to start the SSF DG a minimum of three successive times without recharging. The pressure specified in this SR is intended to reflect the lowest value at which the three starts can be accomplished.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.10.1.7

This Surveillance demonstrates that the fuel oil transfer pump automatically starts and transfers fuel oil from the underground fuel oil storage tank to the day tank. This is required to support continuous operation of SSF DG. This Surveillance provides assurance that the fuel oil transfer pump is OPERABLE, the fuel oil piping system is intact, the fuel delivery piping is not obstructed, and the controls and control systems for automatic fuel transfer systems are OPERABLE.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.8

A sample of fuel oil is required to be obtained from the SSF day tank and underground fuel oil storage tank in accordance with the Diesel Fuel Oil Testing Program in order to ensure that fuel oil viscosity, water, and sediment are within the limits of the Diesel Fuel Oil Testing Program.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.10.1.9

This Surveillance verifies that the SSF DG is capable of synchronizing with the offsite electrical system and accepting loads greater than or equal to the equivalent of the maximum expected accident loads. A minimum run time of 60 minutes is required to stabilize electrical loads, while minimizing the time that the DG is connected to the offsite source.

Although no power factor requirements are established by this SR, the DG is normally operated at a power factor between 0.8 lagging and 1.0. The 0.8 value is the design rating of the machine, while the 1.0 is an operational limitation to ensure circulating currents are minimized. The load band is provided to avoid routine overloading of the DG. Routine overloading may result in more frequent teardown inspections in accordance with vendor recommendations in order to maintain DG OPERABILITY.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

This SR is modified by three Notes. Note 1 indicates that diesel engine runs for this Surveillance may include gradual loading, as recommended by the manufacturer, so that mechanical stress and wear on the diesel engine are minimized. Note 2 states that momentary transients because of changing bus loads do not invalidate this test. Similarly, momentary power factor transients above the limit will not invalidate the test. Note 3 indicates that all DG starts for this Surveillance may be preceded by an engine prelube period and followed by a warmup period prior to loading. This minimizes wear on moving parts that do not get lubricated.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.10

Visual inspection of the battery cells, cell plates, and battery racks provides an indication of physical damage or abnormal deterioration that could potentially degrade battery performance.

The presence of physical damage or deterioration does not necessarily represent a failure of this SR, provided an evaluation determines that the physical damage or deterioration does not affect the OPERABILITY of the battery (its ability to perform its design function).

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.10.1.11

Visual inspection of battery cell to cell and terminal connections provides an indication of physical damage that could potentially degrade battery performance. The anti-corrosion material is used to help ensure good electrical connections and to reduce terminal deterioration. The visual inspection for corrosion is not intended to require removal of and inspection under each terminal connection.

The limits established for this SR must be no more than 20% above the resistance as measured during installation or not above the ceiling value established by the manufacturer.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.12

A battery service test is a special test of the battery capability, as found, to satisfy the design requirements (battery duty cycle) of the DC electrical power system. The discharge rate and test length correspond to the design duty cycle requirements. The design basis discharge time for the SSF battery is one hour.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.10.1.13

CHANNEL CALIBRATION is a complete check of the instrument channel, including the sensor. The test verifies that the channel responds to a measured parameter within the necessary range and accuracy. CHANNEL CALIBRATION leaves the channel adjusted to account for instrument drift to ensure that the instrument channel remains operational between successive tests. CHANNEL CALIBRATION shall find that measurement errors and bistable setpoint errors are within the assumptions of the setpoint analysis. CHANNEL CALIBRATIONS must be performed consistent with the assumptions of the setpoint analysis. The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.10.1.14

Inservice Testing of the SSF valves demonstrates that the valves are mechanically OPERABLE and will operate when required. These valves are required to operate to ensure the required flow path.

The specified Frequency is in accordance with the IST Program requirements. Operating experience has shown that these components usually pass the SR when performed at the IST Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

BASES

SURVEILLANCE REQUIREMENTS (continued)

SR 3.10.1.15

This SR requires the SSF pumps to be tested in accordance with the IST Program. The IST verifies the required flow rate at a discharge pressure to verify OPERABILITY. The SR is modified by a note indicating that it is not applicable to the SSF submersible pump.

The specified Frequency is in accordance with the IST Program requirements. Operating experience has shown that these components usually pass the SR when performed at the IST Frequency. Therefore, the Frequency was concluded to be acceptable from a reliability standpoint.

SR 3.10.1.16

This SR verifies the SSF submersible pump required flow rate at a discharge pressure to verify OPERABILITY.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

REFERENCES

1. UFSAR, Section 9.6.
2. Oconee Probabilistic Risk Assessment.
3. 10 CFR 50.36.
4. IEEE-450-1987.
5. Regulatory Guide 1.9, Rev. 0, December 1974.
6. NRC Letter from L. A. Wiens to H. B. Tucker, "Safety Evaluation Report on Effect of Tornado Missiles on Oconee Emergency Feedwater System," dated July 28, 1989.
7. NRC Letter from L. A. Wiens to J. W. Hampton, "Safety Evaluation for Station Blackout (10 CFR 50.63) - Oconee Nuclear Station, Units 1, 2, and 3," dated March 10, 1992.

BASES

ACTIONS (continued)

B.1

With the Required Action and associated Completion Time not met, or with the required SSF battery with one or more battery cell parameters outside the Category C limit for any connected cell, or with the average electrolyte temperature of representative cells falling below 60°F, sufficient capacity to supply the maximum expected load requirement is not assured and the SSF Power System must be declared inoperable immediately.

SURVEILLANCE REQUIREMENTS

SR 3.10.2.1

This SR verifies that Category A battery cell parameters are consistent with IEEE-450 (Ref. 4), which recommends regular battery inspections including voltage, specific gravity, and electrolyte temperature of pilot cells.

The Surveillance Frequency is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.10.2.2

The periodic inspection of specific gravity and voltage is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

SR 3.10.2.3

This Surveillance verification that the average temperature of representative cells is ≥ 60°F is based on operating experience, equipment reliability, and plant risk and is controlled under the Surveillance Frequency Control Program.

Lower than normal temperatures act to inhibit or reduce battery capacity. This SR ensures that the operating temperatures remain within an acceptable operating range. This limit is based on plant specific calculations.

Table 3.10.2-1

This table delineates the limits on electrolyte level, float voltage, and specific gravity for three different categories. The meaning of each category is discussed below.

BASES

SURVEILLANCE REQUIREMENTS

Table 3.10.2-1 (continued)

Category A defines the normal parameter limit for each designated pilot cell in each battery. The cells selected as pilot cells are those whose temperature, voltage and electrolyte specific gravity are considered to approximate the state of charge of the entire battery.

The Category A limits specified for electrolyte level are based on manufacturer recommendations and are consistent with the guidance in IEEE-450 (Ref. 4), with the extra 1/4 inch allowance above the high water level indication for operating margin to account for temperatures and charge effects. In addition to this allowance, footnote (a) to Table 3.10.2-1 permits the electrolyte level to be above the specified maximum level during equalizing charge, provided it is not overflowing. These limits ensure that the plates suffer no physical damage and that adequate electron transfer capability is maintained in the event of transient conditions. IEEE-450 (Ref. 4) recommends that electrolyte level readings should be made only after the battery has been at float charge for at least 72 hours.

The Category A limit specified for float voltage is ≥ 2.13 V per cell. This value is based on a recommendation of IEEE-450 (Ref. 4), which states that prolonged operation of cells < 2.13 V can reduce the life expectancy of cells.

The Category A limit specified for specific gravity for each pilot cell is ≥ 1.200 (0.015 below the manufacturer fully charged nominal specific gravity or a battery charging current that had stabilized at a low value). This value is characteristic of a charged cell with adequate capacity. According to IEEE-450 (Ref. 4), the specific gravity readings are based on a temperature of 77°F (25°C).

The specific gravity readings are corrected for actual electrolyte temperature and level. For each 3°F (1.67°C) above 77°F (25°C), 1 point (0.001) is added to the reading; 1 point is subtracted for each 3°F below 77°F. The specific gravity of the electrolyte in a cell increases with a loss of water due to electrolysis or evaporation.

Category B defines the normal parameter limits for each connected cell. The term "connected cell" excludes any battery cell that may be jumpered out.

The Category B limits specified for electrolyte level, float voltage, and specific gravity are the same as those specified for Category A and have been discussed above. In addition, it is required that the specific gravity for each connected cell must be no less than 0.010 below the average of all

Oconee Nuclear Station

Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program (TSTF 425)

License Amendment Request
2009-10

March 2010

ATTACHMENT 5

Proposed No Significant Hazards Consideration

Attachment 5
Proposed No Significant Hazards Consideration

Description of Amendment Request: The change requests the adoption of an approved change to the standard technical specifications (STS) for Babcock and Wilcox (B&W) Plants (NUREG-1430), to allow relocation of specific TS surveillance frequencies to a licensee-controlled program. The proposed change is described in Technical Specification Task Force (TSTF) Traveler, TSTF-425 Revision 3 (Rev. 3) (ADAMS Accession No. ML080280275) related to the Relocation of Surveillance Frequencies to Licensee Control—RITSTF Initiative 5b and was described in the Notice of Availability published in the *Federal Register* on July 6, 2009 (74 FR 31916).

The proposed changes are consistent with NRC-approved Industry/Technical Specification Task Force (TSTF) Traveler, TSTF-425, Rev. 3, "Relocate Surveillance Frequencies to Licensee Control—RITSTF Initiative 5b." The proposed change relocates surveillance frequencies to a licensee-controlled program, the Surveillance Frequency Control Program (SFCP). This change is applicable to licensees using probabilistic risk guidelines contained in NRC-approved NEI 04-10, "Risk-Informed Technical Specifications Initiative 5b, Risk-Informed Method for Control of Surveillance Frequencies," (ADAMS Accession No. 071360456).

Basis for proposed no significant hazards consideration: As required by 10 CFR 50.91(a), the Duke analysis of the issue of no significant hazards consideration is presented below:

1. Does the proposed change involve a significant increase in the probability or consequences of any accident previously evaluated?

   Response: No

   The proposed change relocates the specified frequencies for periodic surveillance requirements to licensee control under a new SFCP. Surveillance frequencies are not an initiator to any accident previously evaluated. As a result, the probability of any accident previously evaluated is not significantly increased. The systems and components required by the technical specifications for which the surveillance frequencies are relocated are still required to be operable, meet the acceptance criteria for the surveillance requirements, and be capable of performing any mitigation function assumed in the accident analysis. As a result, the consequences of any accident previously evaluated are not significantly increased.

   Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any previously evaluated?

   Response: No

   No new or different accidents result from utilizing the proposed change. The changes do not involve a physical alteration of the plant (i.e., no new or different type of equipment will be installed) or a change in the methods governing normal plant operation. In addition, the changes do not impose any new or different requirements. The changes do not alter assumptions made in the safety analysis. The proposed changes are consistent with the safety analysis assumptions and current plant operating practice.

Therefore, the proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in the margin of safety?

Response: No

The design, operation, testing methods, and acceptance criteria for systems, structures, and components (SSCs), specified in applicable codes and standards (or alternatives approved for use by the NRC) will continue to be met as described in the plant licensing basis (including the final safety analysis report and bases to TS), since these are not affected by changes to the surveillance frequencies. Similarly, there is no impact to safety analysis acceptance criteria as described in the plant licensing basis. To evaluate a change in the relocated surveillance frequency, Duke will perform a probabilistic risk evaluation using the guidance contained in NRC approved NEI 04-10, Rev. 1 in accordance with the TS SFCP. NEI 04-10, Rev. 1, methodology provides reasonable acceptance guidelines and methods for evaluating the risk increase of proposed changes to surveillance frequencies consistent with Regulatory Guide 1.177.

Therefore, the proposed changes do not involve a significant reduction in a margin of safety.

Based upon the reasoning presented above Duke concludes that, the requested change does not involve a significant hazards consideration as set forth in 10 CFR 50.92(c), Issuance of Amendment.

Oconee Nuclear Station

Relocation of Specific Surveillance Frequency Requirements to a Licensee Controlled Program (TSTF 425)

License Amendment Request
2009-10

March 2010

ATTACHMENT 6

Surveillance Frequency Cross Reference Table
TSTF-425 (NUREG-1430) vs. ONS TS

Attachment 6
Surveillance Frequency Cross Reference Table
TSTF-425 (NUREG-1430) vs. ONS TS

Technical Specification Section Title/Surveillance Description*	TSTF-425	ONS TS
Shutdown Margin (SDM)	**3.1.1**	**3.1.1**
Verify SDM is within the limits specified in the COLR	3.1.1.1	3.1.1.1
Reactivity Balance	**3.1.2**	**3.1.2**
Verify measured core reactivity balance	3.1.2.1	3.1.2.1
CONTROL ROD Group alignment Limits	**3.1.4**	**3.1.4**
Verify individual CONTROL ROD positions	3.1.4.1	3.1.4.1
Verify CONTROL ROD freedom of movement	3.1.4.2	3.1.4.2
Safety Rod Position Limits	**3.1.5**	**3.1.5**
Verify each safety rod is fully withdrawn	3.1.5.1	3.1.5.1
APSR Alignment Limits	**3.1.6**	**3.1.6**
Verify position of each APSR	3.1.6.1	3.1.6.1
Position Indicator Channels	**3.1.7**	**3.1.7**
Perform CHANNEL CHECK of required position indicator channel	3.1.7.1	3.1.7.1
PHYSICS TESTS Exceptions - MODE 1	**3.1.8**	
Verify THERMAL POWER is ≤ RTP	3.1.8.1	
Perform SR 3.2.5.1	3.1.8.2	
Verify nuclear overpower trip setpoint	3.1.8.3	
Verify SDM is within the limits	3.1.8.4	
PHYSICS TESTS Exceptions - MODE 2	**3.1.9**	**3.1.8**
Verify SDM is within the limit	3.1.9.2	3.1.8.2
Regulating Rod Position Limits	**3.2.1**	**3.2.1**
Verify regulating rod groups are within sequence and overlap limits	3.2.1.1	3.2.1.1
Verify regulating rod groups meet the position limits	3.2.1.2	3.2.1.2
AXIAL POWER SHAPING ROD (APSR) Insertion Limit	**3.2.2**	
Verify APSRs are within acceptable limits	3.2.2.1	
AXIAL POWER IMBALANCE Operating Limits	**3.2.3**	**3.2.2**
Verify AXIAL POWER IMBALANCE is within limits	3.2.3.1	3.2.2.1
Quadrant Power Tilt	**3.2.4**	**3.2.3**
Verify QPT is within limits	3.2.4.1	3.2.3.1
RPS Instrumentation	**3.3.1**	**3.3.1**
Perform CHANNEL CHECK	3.3.1.1	3.3.1.1
Compare results of calorimetric heat balance calculation	3.3.1.2	3.3.1.2
Compare out of core measured AXIAL POWER IMBALANCE	3.3.1.3	3.3.1.3
Perform CHANNEL FUNCTIONAL TEST	3.3.1.4	3.3.1.4
Manually verify the setpoints are correct		3.3.1.5
Manually actuate the output channel interposing relays		3.3.1.6
Perform CHANNEL CALIBRATION	3.3.1.5	3.3.1.7
Verify that RPS RESPONSE TIME is within limits	3.3.1.6	
RPS-RTM	**3.3.3**	**3.3.3**
Perform CHANNEL FUNCTIONAL TEST	3.3.3.1	3.3.3.1
CRD Trip Devices	**3.3.4**	**3.3.4**
Perform CHANNEL FUNCTIONAL TEST	3.3.4.1	3.3.4.1

Technical Specification Section Title/Surveillance Description*	TSTF-425	ONS TS
ESFAS Instrumentation	**3.3.5**	**3.3.5**[1]
Perform CHANNEL CHECK.	3.3.5.1	3.3.5.1
Manually verify that the setpoints are correct		3.3.5.2
Perform CHANNEL FUNCTIONAL TEST	3.3.5.2	3.3.5.3
Perform CHANNEL CALIBRATION	3.3.5.3	3.3.5.4
Verify that ESFAS RESPONSE TIME is within limits	3.3.5.4	
ESFAS Manual Initiation	**3.3.6**	**3.3.6**[2]
Perform CHANNEL FUNCTIONAL TEST	3.3.6.1	3.3.6.1
ESFAS Automatic Actuation Logic	**3.3.7**	**3.3.7**[3]
Manually actuate the output channel interposing relays		3.3.7.1
Perform automatic actuation logic CHANNEL FUNCTIONAL TEST.	3.3.7.1	3.3.7.2
Emergency Diesel Generator (EDG) Loss of Power Start (LOPS)	**3.3.8**	
Perform CHANNEL CHECK	3.3.8.1	
Perform CHANNEL FUNCTIONAL TEST.	3.3.8.2	
Perform CHANNEL CALIBRATION with setpoint Allowable Value as follows: ...	3.3.8.4	
Source Range Neutron Flux	**3.3.9**	**3.3.9**
Perform CHANNEL CHECK	3.3.9.1	3.3.9.1
Perform CHANNEL CALIBRATION	3.3.9.2	3.3.9.2
Intermediate Range Neutron Flux	**3.3.10**	**3.3.10**[4]
Perform CHANNEL CHECK	3.3.10.1	3.3.10.1
Perform CHANNEL CALIBRATION	3.3.10.2	3.3.10.2
Emergency Feedwater Initiation and Control (EFIC) System Instrumentation	**3.3.11**	**3.3.11**[5]
Perform CHANNEL CHECK	3.3.11.1	3.3.11.1
Perform CHANNEL FUNCTIONAL TEST	3.3.11.2	3.3.11.2
Perform CHANNEL CALIBRATION	3.3.11.3	3.3.11.3
Verify that EFIC RESPONSE TIME is within limits	3.3.11.4	
Emergency Feedwater Initiation and Control (EFIC) Manual Initiation	**3.3.12**	**3.3.12**[6]
Perform CHANNEL FUNCTIONAL TEST	3.3.12.1	3.3.12.1
Emergency Feedwater Initiation and Control (EFIC) Logic	**3.3.13**	**3.3.13**[7]
Perform CHANNEL FUNCTIONAL TEST	3.3.13.1	3.3.13.1
EFIC-EFW - Vector Valve Logic	**3.3.14**	
Perform a CHANNEL FUNCTIONAL TEST	3.3.14.1	
EFW Pump Initiation Circuitry		**3.3.14**
Perform CHANNEL FUNCTIONAL TEST for each LOMF pump instrumentation channel		3.3.14.1
Perform CHANNEL FUNCTIONAL TEST for each manual initiation circuit		3.3.14.2
Perform CHANNEL FUNCTIONAL TEST for each automatic initiation circuit		3.3.14.3
Perform CHANNEL CALIBRATION for each LOMF pump instrumentation channel		3.3.14.4

[1] ESPS Input Instrumentation for Oconee.
[2] ESPS Manual Initiation for Oconee
[3] ESPS Automatic Actuation Output Logic Channels for Oconee
[4] Wide Range Neutron Flux for Oconee
[5] Automatic Feedwater Isolation Systems (AFIS) Instrumentation for Oconee
[6] AFIS Manual Initiation for Oconee
[7] AFIS Digital Channels for Oconee

Technical Specification Section Title/Surveillance Description*	TSTF-425	ONS TS
Turbine Stop Valve (TSV) Closure		**3.3.15**
Perform CHANNEL FUNCTIONAL TEST		3.3.15.1
Reactor Building (RB) Purge Isolation - High Radiation	**3.3.15**	**3.3.16**
Perform CHANNEL CHECK	3.3.15.1	3.3.16.1
Perform CHANNEL CALIBRATION	3.3.15.3	3.3.16.3
Control Room Isolation - High Radiation	**3.3.16**	
Perform CHANNEL CHECK	3.3.16.1	
Perform CHANNEL FUNCTIONAL TEST.	3.3.16.2	
Perform CHANNEL CALIBRATION with setpoint Allowable Value...	3.3.16.3	
Post Accident Monitoring (PAM) Instrumentation	**3.3.17**	**3.3.8**
Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.	3.3.17.1	3.3.8.1
Perform CHANNEL CALIBRATION	3.3.17.2	3.3.8.2 & 3
Remote Shutdown System	**3.3.18**	
[Perform CHANNEL CHECK for each required instrumentation channel that is normally energized.]	3.3.18.1	
Verify each required control circuit and transfer switch is capable of performing the intended function.	3.3.18.2	
Perform CHANNEL CALIBRATION for each required instrumentation channel.	3.3.18.3	
Emergency Power Switching Logic (EPSL) Automatic Transfer Function		**3.3.17**
Perform CHANNEL FUNCTIONAL TEST		3.3.17.1
EPSL Voltage Sensing Circuits		**3.3.18**
Perform CHANNEL FUNCTIONAL TEST		3.3.18.1
EPSL 230 kV Switchyard Degraded Grid Voltage Protection (DGVP)		**3.3.19**
Perform CHANNEL FUNCTIONAL TEST		3.3.19.1
Perform CHANNEL CALIBRATION		3.3.19.2
EPSL CT-5 DGVP		**3.3.20**
Perform CHANNEL FUNCTIONAL TEST		3.3.20.1
Perform CHANNEL CALIBRATION		3.3.20.2
EPSL Keowee Emergency Start Function		**3.3.21**
Perform CHANNEL FUNCTIONAL TEST		3.3.21.1
EPSL Keowee Manual Emergency Start Function		**3.3.22**
Perform CHANNEL FUNCTIONAL TEST		3.3.22.1
Main Feeder Bus Monitor Panel		**3.3.23**
Perform CHANNEL FUNCTIONAL TEST		3.3.23.1
Low Pressure Service Water (LPSW) Reactor Building Waterhammer Prevention		**3.3.27**
Perform CHANNEL CHECK		3.3.27.1
Perform CHANNEL FUNCTIONAL TEST		3.3.27.2
Perform CHANNEL CALIBRATION		3.3.27.3
LPSW Standby Pump Auto-Start Circuitry		**3.3.28**
Perform CHANNEL FUNCTIONAL TEST		3.3.28.1
Perform CHANNEL CALIBRATION		3.3.28.2

Technical Specification Section Title/Surveillance Description*	TSTF-425	ONS TS
RCS Pressure, Temperature, and Flow Departure from Nucleate Boiling (DNB) Limits	**3.4.1**	**3.4.1**
Verify RCS loop pressure	3.4.1.1	3.4.1.1
Verify RCS hot leg temperature	3.4.1.2	3.4.1.2
Verify RCS total flow	3.4.1.3	3.4.1.3
Verify RCS total flow rate	3.4.1.4	3.4.1.4
RCS Minimum Temperature for Criticality	**3.4.2**	**3.4.2**
Verify RCS T_{avg}	3.4.2.1	
RCS Pressure and Temperature (P/T) Limits	**3.4.3**	**3.4.3**
Verify RCS pressure, RCS temperature, and RCS heatup and cooldown rates are within the limits	3.4.3.1	3.4.3.1
RCS Loops - MODES 1 and 2	**3.4.4**	**3.4.4**
Verify required RCS loops are in operation	3.4.4.1	3.4.4.1
RCS Loops - MODE 3	**3.4.5**	**3.4.5**
Verify one RCS loop is in operation	3.4.5.1	3.4.5.1
Verify correct breaker alignment and indicated power available to each required pump	3.4.5.2	3.4.5.2
RCS Loops - MODE 4	**3.4.6**	**3.4.6**
Verify required DHR loop is in operation	3.4.6.1	3.4.6.1
Verify correct breaker alignment and indicated power available to each required DHR pump.	3.4.6.2	3.4.6.2
RCS Loops - MODE 5, Loops Filled	**3.4.7**	**3.4.7**
Verify required DHR loop is in operation	3.4.7.1	3.4.7.1
Verify required SG secondary side water levels are ≥ [50]%.	3.4.7.2	3.4.7.2
Verify correct breaker alignment and indicated power available to each required DHR pump	3.4.7.3	3.4.7.3
RCS Loops - MODE 5, Loops Not Filled	**3.4.8**	**3.4.8**
Verify required DHR loop is in operation	3.4.8.1	3.4.8.1
Verify correct breaker alignment and indicated power available to each required DHR pump	3.4.8.2	3.4.8.2
Pressurizer	**3.4.9**	**3.4.9**
Verify pressurizer water level	3.4.9.1	3.4.9.1
[Verify ≥ [126] kW of pressurizer heaters are capable of being powered from an emergency power supply.]	3.4.9.2	
[Verify emergency power supply for pressurizer heaters is OPERABLE.]	3.4.9.3	
Verify the capacity of required pressurizer heaters and associated power supplies.		3.4.9.2
Pressurizer PORV	**3.4.11**	
Perform one complete cycle of the block valve.	3.4.11.1	
Perform one complete cycle of the PORV.	3.4.11.2	
Verify PORV and block valve are capable of being powered from an emergency power source.	3.4.11.3	
Low Temperature Overpressure Protection (LTOP) System	**3.4.12**	**3.4.12**
Verify a maximum of [one] makeup pump is capable of injecting into the RCS.	3.4.12.1	
Verify HPI is deactivated	3.4.12.2	3.4.12.1
Verify each CFT is isolated	3.4.12.3	3.4.12.2
Verify pressurizer level	3.4.12.4	3.4.12.3

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Verify PORV block valve is open	3.4.12.5	3.4.12.4
Verify required RCS vent ≥ [0.75] square inch is open	3.4.12.6	
Perform CHANNEL FUNCTIONAL TEST for PORV	3.4.12.7	3.4.12.5
Verify Administrative Controls		3.4.12.6
Perform CHANNEL CALIBRATION for PORV	3.4.12.8	3.4.12.7
RCS Operational LEAKAGE	**3.4.13**	
Verify RCS operational Leakage is within limits	3.4.13.1	3.4.13.1
Verify steam generator tube integrity is in accordance with the Steam Generator Tube Surveillance Program.	3.4.13.2	
Verify primary to secondary LEAKAGE is ≤ 150 gpd…		3.4.13.2
RCS Pressure Isolation Valve (PIV) Leakage	**3.4.14**	**3.4.14**
Verify leakage from each RCS PIV is equivalent to…	3.4.14.1	3.4.14.1
Verify DHR System autoclosure interlock prevents the valves from being opened with a simulated or actual RCS pressure signal ≥ [425] psig	3.4.14.2	
Verify DHR System autoclosure interlock causes the valves to close automatically with a simulated or actual RCS pressure signal ≥ [600] psig.	3.4.14.3	
RCS Leakage Detection Instrumentation	**3.4.15**	**3.4.15**
Perform CHANNEL CHECK of required containment atmosphere radioactivity monitor.	3.4.15.1	3.4.15.1
Perform CHANNEL FUNCTIONAL TEST of required containment atmosphere radioactivity monitor.	3.4.15.2	3.4.15.2
Perform CHANNEL CALIBRATION of required containment sump monitor.	3.4.15.3	3.4.15.3
Perform CHANNEL CALIBRATION of required containment atmosphere radioactivity monitor.	3.4.15.4	3.4.15.4
RCS Specific Activity	**3.4.16**	**3.4.11**
Verify reactor coolant gross specific activity ≤ 100/Ē μCi/gm.	3.4.16.1	3.4.11.1
Verify reactor coolant DOSE EQUIVALENT I-131 specific activity ≤ 1.0 μCi/gm.	3.4.16.2	3.4.11.2
Determine Ē.	3.4.16.3	3.4.11.3
Core Flood Tanks (CFTs)	**3.5.1**	**3.5.1**
Verify each CFT isolation valve is fully open…	3.5.1.1	3.5.1.1
Verify borated water volume in each CFT is…	3.5.1.2	3.5.1.2
Verify nitrogen cover pressure in each CFT is…	3.5.1.3	3.5.1.3
Verify boron concentration in each CFT is…	3.5.1.4	3.5.1.4
Verify power is removed from each CFT isolation valve operator…	3.5.1.5	3.5.1.5
ECCS - Operating	**3.5.2**	**3.5.2 & 3**[8]
Verify the following valves are in the listed position….	3.5.2.1	
Verify each ECCS … valve in the flow path…is in the correct position	3.5.2.2	3.5.2.1 3.5.3.1
Verify ECCS piping is full of water	3.5.2.3	3.5.2.2 3.5.3.2
Verify each automatic ECCS…valve in the flow path…actuates to the correct position…	3.5.2.5	3.5.2.4 3.5.3.4
Verify each ECCS pump starts automatically….	3.5.2.6	3.5.2.5 3.5.3.5

[8] Oconee has separate Technical Specifications for High Pressure and Low Pressure Injection

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Verify the correct settings of stops for the following HPI stop check valves:	3.5.2.7	
[Verify the flow controllers for the following LPI throttle valves operate properly: ...]	3.5.2.8	
Verify, by visual inspection, each ECCS train containment sump inlet is not restricted...	3.5.2.9	3.5.2.6 3.5.3.6
Cycle each HPI discharge crossover valve and LPI-HPI flow path discharge valve		3.5.2.7
Borated Water Storage Tank (BWST)	**3.5.4**	**3.5.4**
Verify BWST borated water temperature is ...	3.5.4.1	3.5.4.1
Verify BWST borated water volume is...	3.5.4.2	3.5.4.2
Verify BWST boron concentration is...	3.5.4.3	3.5.4.3
Containment Air Locks	**3.6.2**	**3.6.2**
Verify only one door in the air lock can be opened at a time.	3.6.2.2	3.6.2.2
Containment Isolation Valves	**3.6.3**	**3.6.3**
Verify each [48] inch purge valve is sealed closed	3.6.3.1	3.6.3.1
Verify each [8] inch purge valve is closed except when the [8] inch purge valves are open for pressure control	3.6.3.2	
Verify each containment isolation manual valve and blind flange that is located outside containment and not locked, sealed, or otherwise secured...	3.6.3.3	3.6.3.2
Verify the isolation time of each automatic power operated containment isolation valve is within limits	3.6.3.5[9]	
Perform leakage rate testing for containment purge valves with resilient seals.	3.6.3.6	
Verify each automatic containment isolation valve that is not locked, sealed, or otherwise secured in position, actuates to the isolation position on an actual or simulated actuation signal.	3.6.3.7	3.6.3.5
[Verify each [ ] inch containment purge valve is blocked to restrict the valve from opening > [50]%.]	3.6.3.8	
Containment Pressure	**3.6.4**	**3.6.4**
Verify containment pressure is within limits	3.6.4.1	3.6.4.1
Containment Air Temperature	**3.6.5**	
Verify containment average air temperature is within limit.	3.6.5.1	
Containment Spray and Cooling Systems	**3.6.6**	**3.6.5**
Verify each containment spray manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	3.6.6.1	3.6.5.1
Operate each [required] containment cooling train fan unit for ≥ 15 minutes.	3.6.6.2	3.6.5.2
Verify each [required] containment cooling train cooling water flow rate is ≥ [1780] gpm.	3.6.6.3	
Verify that the containment heat removal capability is sufficient to maintain post accident conditions within design limits.		3.6.5.4
Verify each automatic containment spray valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	3.6.6.5	3.6.5.5
Verify each containment spray pump starts automatically on an actual or simulated actuation signal.	3.6.6.6	3.6.5.6

[9] The BWOG STS offer an option of "in accordance with the IST Program or 92 days." Duke refers to IST Program for frequency therefore TSTF does not apply.

Technical Specification Section Title/Surveillance Description*	**TSTF-425**	**ONS TS**
Verify each [required] containment cooling train starts automatically on an actual or simulated actuation signal.	3.6.6.7	3.6.5.7
Verify each spray nozzle is unobstructed	3.6.6.8	3.6.5.8
Spray Additive System	**3.6.7**	
Verify each spray additive manual, power operated, and automatic valve in the flow path that is not locked, sealed, or otherwise secured in position is in the correct position.	3.6.7.1	
Verify spray additive tank solution volume is ...	3.6.7.2	
Verify spray additive tank [NaOH] solution concentration is ...	3.6.7.3	
Verify each spray additive automatic valve in the flow path actuates to the correct position on an actual or simulated actuation signal.	3.6.7.4	
Verify Spray Additive System flow [rate] from each solution's flow path.	3.6.7.5	
Main Steam Isolation Valves (MSIVs)	**3.7.2**	
Verify isolation time of each MSIV is ≤ [6] seconds.	3.7.2.1	
Verify each MSIV actuates to the isolation position on an actual or simulated actuation signal.	3.7.2.2	
Turbine Stop Valves (TSVs)		**3.7.2**
Verify Closure Time of each TSV...on an actual or simulated actuation signal from Channel A		3.7.2.1
Verify Closure Time of each TSV...on an actual or simulated actuation signal from Channel B		3.7.2.2
[MFSVs, MFCVs, and Associated SFCVs]	**3.7.3**	**3.7.3**
Verify each [MFSV], [MFCV], and [SFCV] actuates to the isolation position on an actual or simulated actuation signal.	3.7.3.2	
Atmospheric Vent Valves (AVVs)	**3.7.4**	
Verify one complete cycle of each AVV.	3.7.4.1	
Verify one complete cycle of each AVV block valve.	3.7.4.2	
Atmospheric Dump Valve (ADV) Flow Paths		**3.7.4**
Cycle the valves that comprise the ADV flow path		3.7.4.1
Emergency Feedwater (EFW) System	**3.7.5**	**3.7.5**
Verify each EFW manual, power operated, and automatic valve ... is in the correct position.	3.7.5.1	3.7.5.1
Verify each EFW automatic valve ... actuates to the correct position on an actual or simulated actuation signal.	3.7.5.3	3.7.5.3
Verify each EFW pump starts automatically on an actual or simulated actuation signal.	3.7.5.4	3.7.5.4
Perform a CHANNEL FUNCTIONAL TEST for the EFW pump suction pressure interlocks.	3.7.5.6	
Perform a CHANNEL CALIBRATION for the EFW pump suction pressure interlocks.	3.7.5.7	
Condensate Storage Tank (CST)	**3.7.6**	**3.7.6**[10]
Verify CST level is ≥ [250,000] gal.	3.7.6.1	3.7.6.1
Component Cooling Water (CCW) System	**3.7.7**	
Verify each CCW manual, power operated, and automatic valve in the flow path ... is in the correct position.	3.7.7.1	

[10] Upper Surge Tank (UST) and Hotwell (HW) for Oconee

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Verify each CCW automatic valve in the flow path … actuates to the correct position on an actual or simulated actuation signal.	3.7.7.2	
Verify each CCW pump starts automatically on an actual or simulated actuation signal.	3.7.7.3	
Service Water System (SWS)	**3.7.8**	**3.7.7**[11]
Verify LPSW leakage accumulator level is within water levels…for Units with LPSW RB Waterhammer modification installed.		3.7.7.1
Verify each SWS manual, power operated, and non-automatic valve in the flow path servicing safety related equipment … is in the correct position.	3.7.8.1	3.7.7.2
Verify each SWS automatic valve in the flow path that is not locked, sealed, or otherwise secured in position, actuates to the correct position on an actual or simulated actuation signal.	3.7.8.2	3.7.7.3
Verify each SWS pump starts automatically on an actual or simulated actuation signal.	3.7.8.3	3.7.7.4
Verify LPSW leakage accumulator is able to provide makeup flow lost due to boundary valve leakage on Units with LPSW RB Waterhammer modification installed		3.7.7.5
Verify LPSW WPS boundary leakage is ≤ 20 gpm for Units LPSW RB Waterhammer modification installed		3.7.7.6
Ultimate Heat Sink (UHS)	**3.7.9**	**3.7.8**[12]
Verify required Essential Siphon Vacuum pumps are in operation		3.7.8.1
[Verify water level of UHS is ≥ [562] ft [mean sea level]	3.7.9.1	3.7.8.2
[Verify average water temperature of UHS is ≤ [90]°F.]	3.7.9.2	3.7.8.3
[Operate each cooling tower fan for > [15] minutes.	3.7.9.3	
Verify each manual and non-automatic power operated valve in each ECCW siphon header flow path…is in the correct position.		3.7.8.4
Verify upon an actual or simulated actuation signal each ESV float valve actuates to the correct position.		3.7.8.5
Verify upon an actual or simulated actuation signal each required ESV and Siphon Seal Water (SSW) valve actuates to the correct position.		3.7.8.6
Verify the developed capacity of each required ESV pump at the test point is greater than or equal to the required capacity.		3.7.8.7
Verify each required ESV pump automatically starts in ≤ 1200 seconds upon an actual or simulated restoration of emergency power.		3.7.8.8
Verify upon an actual or simulated trip of the CCW pumps and ESV pumps that the rate of water level drop in the ECCW siphon header is within limits		3.7.8.9
Control Room Emergency Ventilation System (CREVS)	**3.7.10**	**3.7.9**[13]
Operate each CREVS train for [≥ 10 continuous hours with the heaters operating or (for system without heaters) ≥ 15 minutes].	3.7.10.1	3.7.9.1
Verify [each CREVS train actuates] [or the control room isolates] on an actual or simulated actuation signal.	3.7.10.3	
Verify one CREVS train can maintain a positive pressure of ≥ [0.125] inches water gauge relative to the adjacent [area] during the [pressurization] mode of operation at a flow rate of ≤ [3300] cfm.	3.7.10.4	3.7.9.3

[11] Low Pressure Service Water for Oconee
[12] Emergency Condenser Circulating Water (ECCW) System for Oconee
[13] CRVS Booster Fans for Oconee

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[Verify the system makeup flow rate is ≥ [270] and ≤ [330] cfm when supplying the control room with outside air.]	3.7.10.5	
Control Room Emergency Air Temperature Control System (CREATCS)	**3.7.11**	**3.7.16**[14]
Verify each CREATCS train has the capability to remove the assumed heat load.	3.7.11.1	
Verify temperature in the Control room and Cable Room is ≤ 80°F and temperature in the electrical Equipment room is ≤ 85°F		3.7.16.1
Emergency Ventilation System (EVS)	**3.7.12**	
Fuel Storage Pool Ventilation System (FSPVS)	**3.7.13**	**3.7.17**[15]
[Operate each FSPVS train for [≥10 continuous hours with the heaters operating or (for systems without heaters) ≥ 15 minutes].	3.7.13.1	
[Verify each FSPVS train actuates on an actual or simulated actuation signal.]	3.7.13.3	
Verify one FSPVS train can maintain a pressure ≤ [ ] inches water gauge with respect to atmospheric pressure during the [post accident] mode of operation at a flow rate ≤ [3 000] cfm.	3.7.13.4	
[Verify each FSPVS filter bypass damper can be opened.]	3.7.13.5	
Fuel Storage Pool Water Level	**3.7.14**	**3.7.11**[16]
Verify the fuel storage pool water level is ≥ 23 ft above the top of irradiated fuel assemblies seated in the storage racks.	3.7.14.1	3.7.11.1
[Spent Fuel Pool Boron Concentration]	**3.7.15**	**3.7.12**
Verify the spent fuel pool boron concentration is within limit.	3.7.15.1	3.7.12.1
Secondary Specific Activity	**3.7.17**	**3.7.14**
Verify the specific activity of the secondary coolant is ≤ [0.10] µCi/gm DOSE EQUIVALENT I-131.	3.7.17.1	3.7.14.1
Steam Generator Level	3.7.18	
AC Sources - Operating	**3.8.1**	**3.8.1**
Verify correct breaker alignment and indicated power availability for each [required] offsite circuit.	3.8.1.1	3.8.1.1
Verify each DG starts from standby conditions and achieves steady state voltage...	3.8.1.2	
Verify each DG is synchronized and loaded and operates for ...	3.8.1.3	
Verify each day tank [and engine mounted tank] contains ...	3.8.1.4	
Check for and remove accumulated water from each day tank ...	3.8.1.5	
Verify the fuel oil transfer system operates to [automatically] transfer fuel oil from storage tank[s] to the day tank [and engine mounted tank].	3.8.1.6	
Verify each DG starts from standby condition and achieves: ...	3.8.1.7	
Verify [automatic [and] manual] transfer of AC power sources from the normal offsite circuit to each alternate [required] offsite circuit.	3.8.1.8	
Verify each DG rejects a load greater than or equal to its associated single largest post-accident load, and: ...	3.8.1.9	
Verify each DG does not trip, and voltage is maintained ...	3.8.1.10	
Verify on an actual or simulated loss of offsite power signal:...	3.8.1.11	
Verify on an actual or simulated [Engineered Safety Feature (ESF)] actuation signal each DG auto-starts from standby condition and:	3.8.1.12	3.8.1.9

[14] Control Room Area Cooling System for Oconee
[15] Spent Fuel Pool Ventilation System for Oconee
[16] Spent Fuel Pool Water Level for Oconee

Technical Specification Section Title/Surveillance Description*	TSTF-425	ONS TS
Verify each DG's noncritical automatic trips are bypassed on [actual or simulated loss of voltage signal on the emergency bus concurrent with an actual or simulated €SF actuation signal].	3.8.1.13	
Verify each DG operates for 24 hours: ...	3.8.1.14	
Verify each DG starts and achieves:	3.8.1.15	3.8.1.9
Verify each DG: a. Synchronizes with offsite power source while loaded with emergency loads upon a simulated restoration of offsite power, b. Transfers loads to offsite power source, and c. Returns to ready-to-load operation.	3.8.1.16	
Verify, with a DG operating in test mode and connected to its bus, an actual or simulated ESF actuation signal overrides the test mode by: ...	3.8.1.17	
Verify interval between each sequenced load block is within ... for each emergency [and shutdown] load sequencer.	3.8.1.18	
Verify on an actual or simulated loss of offsite power signal in conjunction with an actual or simulated ESF actuation signal: a. De-energization of emergency buses, b. Load shedding from emergency buses, c. DG auto-starts from standby condition and: 1. Energizes permanently connected loads in ...seconds, 2. Energizes auto-connected emergency loads through [load sequencer], 3. Achieves steady-state voltage ... 4. Achieves steady-state frequency... and 5. Supplies permanently connected and auto-connected emergency loads...	3.8.1.19	
Verify, when started simultaneously from standby condition, each DG achieves, in ≤ [10] seconds, voltage ... and frequency...	3.8.1.20	
Verify battery terminal voltage is ≥ 125 V on float charge for each KHU's battery		3.8.1.2
Verify the KHU associated with the underground emergency power path starts automatically and energizes the underground emergency power path. Manually close the SK breaker to each de-energized standby bus.		3.8.1.3
Verify the KHU associated with the overhead emergency power path starts automatically and automatically or manually synchronize it to the Yellow bus in 230 kV switchyard. Energize the underground emergency power path after removing the KHU from the overhead emergency power path.		3.8.1.4
Verify each closed SL and each closed N breaker opens manually or on an actual or simulated actuation signal.		3.8.1.5
Operate each S and each E breaker through a full cycle.		3.8.1.6
Verify both KHU's underground tie breakers cannot be closed simultaneously.		3.8.1.7
Verify each KHU's overhead emergency power path tie breaker cannot be closed when tie breaker to underground emergency power path is closed.		3.8.1.8
Verify each KHU's battery capacity is adequate to supply, and maintain in OPERABLE status, required emergency loads for design duty cycle when subjected to a battery service test.		3.8.1.10
Verify each KHU's battery cells, cell end plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.		3.8.1.11
Verify each KHU's battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.		3.8.1.12

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Verify on an actual or simulated zone overlap fault signal each KHU's overhead tie breaker and underground tie breaker actuate to the correct position.		3.8.1.13
Verify each closed SL and closed N breaker opens on an actuation of each redundant trip coil.		3.8.1.14
Verify each 230 kV switchyard circuit breaker actuates to the correct position on a switchyard isolation actuation signal.		3.8.1.15
Verify each KHU's Voltage and Frequency out of tolerance logic trips and blocks closure of the appropriate overhead or underground power path breakers. The allowable values with a time delay of 5 seconds ± 1 second shall be as follows:...		3.8.1.17
Diesel Fuel Oil, Lube Oil, and Starting Air	**3.8.3**	
Verify each fuel oil storage tank contains ≥ [33,000] gal of fuel.	3.8.3.1	
Verify lube oil inventory is ≥ [500] gal.	3.8.3.2	
Verify each DG air start receiver pressure is ≥ [225] psig	3.8.3.4	
Check for and remove accumulated water from each fuel oil storage tank.	3.8.3.5	
DC Sources - Operating	**3.8.4**	**3.8.3**
Verify battery terminal voltage is greater than or equal to the minimum established float voltage.	3.8.4.1	3.8.3.2
Verify each battery charger supplies 2 [400] amps at greater than or equal to the minimum established float voltage for 2 [8] hours. OR Verify each battery charger can recharge the battery to the fully charged state within [24] hours while supplying the largest combined demands of the various continuous steady state loads, after a battery discharge to the bounding design basis event discharge state.	3.8.4.2	
Verify battery capacity is adequate to supply, and maintain in OPERABLE status, the required emergency loads for the design duty cycle when subjected to a battery service test.	3.8.4.3	3.8.3.5
Verify correct breaker alignments and voltage availability from required distribution centers to isolating transfer diodes.		3.8.3.1
Verify battery cells, cell plates, and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.		3.8.3.3.
Verify battery cell to cell and terminal connections are clean and tight, and are coated with anti-corrosion material.		3.8.3.4
Battery Parameters	**3.8.6**	**3.8.5**[17]
Verify each battery float current is ≤ [2] amps.	3.8.6.1	
Verify each battery pilot cell voltage is ≥ [2.07] V.	3.8.6.2	
Verify each battery connected cell electrolyte level is greater than or equal to minimum established design limits.	3.8.6.3	
Verify each battery pilot cell temperature is greater than or equal to minimum established design limits.	3.8.6.4	
Verify each battery connected cell voltage is ≥ [2.07] V.	3.8.6.5	
Verify battery capacity is ≥ [80%] of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test.	3.8.6.6	

[17] Battery Cell Parameters for Oconee

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Verify battery cell parameters meet Table 3.8.5-1 Category A limits.		3.8.5.1
Verify battery cell parameters meet Table 3.8.5-1 Category B limits.		3.8.5.2
Verify average electrolyte temperature of representative cells is ≥ 60°F.		3.8.5.3
Inverters - Operating	**3.8.7**	**3.8.6**[18]
Verify correct inverter voltage, [frequency,) and alignment to required AC vital buses.	3.8.7.1	3.8.6.1
Inverters Shutdown	**3.8.8**	**3.8.7**[19]
Verify correct inverter voltage, [frequency,) and alignment to required AC vital buses.	3.8.8.1	3.8.7.1
Distribution Systems - Operating	**3.8.9**	**3.8.8**
Verify correct breaker alignments and voltage to [required] AC, DC, and AC vital bus electrical power distribution subsystems.	3.8.9.1	3.8.8.1 & 2
Distribution Systems - Shutdown	**3.8.10**	**3.8.9**
Verify correct breaker alignments and voltage to required AC, DC, and AC vital bus electrical power distribution subsystems.	3.8.10.1	3.8.9.1 & 2
Boron Concentration	**3.9.1**	**3.9.1**
Verify boron concentration is within the limit specified in the COLR.	3.9.1.1	3.9.1.1
Nuclear Instrumentation	**3.9.2**	**3.9.2**
Perform CHANNEL CHECK	3.9.2.1	3.9.2.1
Perform CHANNEL CALIBRATION	3.9.2.2	3.9.2.2
Containment Penetrations	**3.9.3**	**3.9.3**
Verify each required containment penetration is in the required status	3.9.3.1	3.9.3.1
Verify each required containment purge and exhaust valve actuates to the isolation position on an actual or simulated actuation signal.	3.9.3.2[20]	
DHR and Coolant Circulation - High Water Level	**3.9.4**	**3.9.4**
Verify one DHR loop is in operation	3.9.4.1	3.9.4.1
DHR and Coolant Circulation - Low Water Level	**3.9.5**	**3.9.5**
Verify one DHR loop is in operation	3.9.5.1	3.9.5.1
Verify correct breaker alignment and indicated power available to the required DHR pump that is not in operation	3.9.5.2	3.9.5.2
Refueling Canal Water Level	**3.9.6**	**3.9.6**[21]
Verify refueling canal water level is ~ 23 ft above the top of reactor vessel flange.	3.9.6.1	3.9.6.1
Unborated Water Source Isolation Valves		**3.9.7**
Verify each valve that isolates unborated water sources is secured in the closed position		3.9.7.1
Standby Shutdown Facility		**3.10.1**
Perform CHANNEL CHECK for each required SSF instrument channel.		3.10.1.1
Verify required SSF battery terminal voltage is ≥ 125 VDC on float charge.		3.10.1.2
Verify the day tank contains ≥ 200 gallons of fuel.		3.10.1.3
Verify the underground oil storage tank contains ≥ 25,000 gallons of fuel.		3.10.1.4
Verify the DG starts from standby conditions and achieves steady state voltage and frequency.		3.10.1.5

[18] Vital Inverters – Operating for Oconee
[19] Vital Inverters – Shutdown for Oconee
[20] Frequency not relocated to SFCP, Oconee frequency is on a once per refueling outage prior to movement of irradiated fuel assemblies within containment versus the BWOG STS frequency of 18 months.
[21] Fuel Transfer Canal Water Level for Oconee.

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Verify DG required air start receiver pressure is ≥ 150 psig.		3.10.1.6
Verify the fuel oil transfer system operates to automatically transfer fuel oil from the storage tank to the day tank.		3.10.1.7
Verify the fuel oil properties of the fuel oil stored in the day tank and underground storage tank are tested in accordance with, and maintained within the limits of the Diesel Fuel Oil Testing Program.		3.10.1.8
Verify the SSF DG is synchronized and loaded and operated for ≥ 60 minutes at a load ≥ 3280 kW.		3.10.1.9
Verify for required SSF battery that the cells, cell plates and racks show no visual indication of physical damage or abnormal deterioration that could degrade battery performance.		3.10.1.10
Verify for required SSF battery that the cell to cell and terminal connections are clean, tight and coated with anti-corrosion material		3.10.1.11
Verify battery capacity of required battery is adequate to supply, and maintain in OPERABLE status, the required maximum loads for the design duty cycle when subjected to a battery service test.		3.10.1.12
Perform CHANNEL CALIBRATION for each required SSF instrument channel.		3.10.1.13
Verify the developed head of the SSF submersible pump at the flow test point is greater than or equal to the required developed head.		3.10.1.16
Standby Shutdown Facility Battery Cell Parameters		**3.10.2**
Verify battery cell parameters meet Table 3.10.2-1 Category A limits.		3.10.2.1
Verify battery cell parameters meet Table 3.10.2-1 Category B limits.		3.10.2.2
Verify average electrolyte temperature of representative cells is ≥ 60°F.		3.10.2.3
KHU Commercial Power Generation Testing Program		**5.5.18**
Verify upon an actual or simulated actuation signal, each KHU's overhead tie breaker and underground tie breaker actuate to the correct position from an initial condition of commercial power generation every 18 months.		5.5.18.a
Verify upon an actual or simulated actuation signal, each KHU's frequency is ≤ 66 Hz in ≤ 23 seconds from an initial condition of commercial power generation every 18 months.		5.5.18.b
Lee Combustion Turbine Testing Program		**5.5.19**
Verify an LCT can energize both standby buses using 100kV line electrically separated from system grid and offsite loads every 12 months.		5.5.19.a
Verify an LCT can supply equivalent of one Unit's Loss of Coolant Accident (LOCA) loads plus two Unit's Loss of Offsite Power (LOOP) loads when connected to system grid every 12 months.		5.5.19.b
Verify an LCT can provide equivalent of one Unit's LOCA loads within one hour through 100kV line electrically separated from system grid and offsite loads every 18 months.		5.5.19.c
Battery Discharge Testing Program		**5.5.20**
Verify battery capacity is ≥ 80% of the manufacturer's rating when subjected to a performance discharge test or a modified performance discharge test once every 60 months.		5.5.20.a

* The Surveillance Description is a summary description of the referenced Surveillances and is not intended to be a verbatim description of the TS Surveillances.